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LONDON, SATURDAY, AUGUST 21, 1841.

MEMOIRS OF MADAME LAFFARGE, WRITTEN BY HERSELF.

[Continued.]

[The last scene extracted from these Memoirs, was that of the disappearance of Mad. Léautaud's jewels at the chateau. For the present we shall give the account of Marie Cappelle's marriage with M. Laffarge. She was engaged, she tells us, in getting up private theatricals in the company of her friends, when—]

I received a letter from my aunt Garat, recalling me to Paris, where my uncle De Martens awaited me with a husband. "My God! what has befallen you?" exclaimed Madame de Montbreton, seeing my countenance as I read the letter. "A husband proposed," said I. After some deliberation, it was determined that we should finish our rehearsal, and that I should write that my return was necessarily delayed for a day, not to spoil the pleasure of others. Fatigued with emotion, and stunned with applause, I sprung from the stage of our little theatre into a carriage, and was wafted back to Paris, inebriated with the joint perfumes of my flowers and my theatrical success. My aunt received me coldly. She had come to town for the interview, and my delay of a day had obliged the young man to leave on account of business, and put it off to the end of the week. This gentleman was a postmaster's son, of the environs of Paris—rich, twenty-five, and good-looking. I did not participate in the general enthusiasm, but decided on making a suitable marriage—my reason prevailed. Still my vanity rather revolted at the idea of marrying a postmaster; for such speculations are generally undertaken by coarse farmers, possessed of money, skilled in calculating, but not in any cultivated employment of intellect, abounding in vanity and stupidity. I hazarded some of these remarks, which were not very well received. I was given to understand, that without either beauty or fortune I could expect no better; and my aunt, in her wish to see me married and happy, forgot that she wounded my vanity, and made me doubt her affection. The following day M. Martens came to us with a mysterious look; he had reflected on my objections; he appreciated them, and offered an owner of an iron-foundry, in lieu of the postmaster's son. I could not forbear laughing with my aunt Garat, as I asked him where he had found such a mine of husbands. He did not join in our hilarity, and replied coldly that he had become acquainted with them at the house of a rich merchant, with whom he did business. I only knew one owner of iron-works, M. Muel—rich and well educated; he passed six months in Paris, and six months in the Vosges: I had been told, that those speculations gave one great influence in the country: my first impression was therefore favourable; and as the contagion of marrying me was gaining, in a most formidable manner, relations and friends, as it was necessary to submit to the common lot, I resolved this time to examine seriously, and with a firm design of no longer drawing back, if all the required conditions were to be found. M. Martens had no positive information; he feared the distance from Paris might alarm me, and my aunt also disliked the idea of this separation, which seemed an exile. This idea did not affect me for a moment: I had been at Strasburg; I knew that there was civilization even at a hundred leagues from Paris; with wealth, distance disappears; and as to a country life, my head was too full of the pleasures of Corcy to dread that. More particular details at length arrived. M. Laffarge was twenty-eight years of age, of an honourable family, well-known morality, great cleverness, and desirous of extending his business as far as possible. He possessed one of the most agreeable estates in Limousin, a manufactory, a forge, two hundred thousand francs in land, safe from the chances of speculation, and considerable revenue from his foundry: he had come to Paris, I was told, on business, and he wished to take back with him to his retreat as wife, a well-educated woman, who could cheer him by her wit and talents. He had no relative at Paris, but M. Gauthier, deputy of Uzerches, and General Petit, peer of France, would answer for him. My aunt forgot the hundred leagues which were to separate us, in listening to the account of the position of M. Laffarge. I also was perfectly satisfied. As nothing was said of his personal appearance, I was rather fearful; but calling to mind the appearance of the others, so uninviting, I concluded he must, of *necessity*, be more prepossessing. It became necessary to arrange a first interview, in order that the refusal on both sides might be less embarrassing and more easy; it was agreed that we should see and judge each other at the concert in the Rue Vivienne. M. Martens was to meet us by chance, and introduce M. Laffarge as a friend of his; a conversation would take place, and we should become acquainted, and the next morning could give our mutual opinion of each other. My aunt was so delighted at the prospects which were opening for me, she promised me so much happiness, and such a splendid wedding gift, that I gave myself up quietly and carelessly to golden dreams, and obedient this time to the common sense of the world, I believed myself under the empire of reason, because I was not under that of the heart.

The first time I saw M. Laffarge was on a Wednesday: the weather was beautiful; there was not a cloud in the sky, not a presentiment in my heart. Alas! plaintive breeze, which sometimes comes to sympathize with mankind, why did your sighs not wake an echo in my heart! Clouds which bear the tempest, why did not your thunders arouse me—your lightnings show me the abyss?—and you, beautiful stars, shining above me, not one of you fell, to give presage of death to poor Marie! My aunt had decked me out in the colours which best suited me. The orchestra, playing the fascinating waltzes of Strauss, had animated my countenance with the thought of balls and pleasures. I was pretty enough when M. Laffarge saw me, and I immediately perceived that I pleased him. My first impression was not so favourable—I found him very ugly. His face and figure was of the commonest; he conversed with me for some time, but his words were lost in the sounds of the music; and on retiring to rest, my head was too full of the German melodies to remember the all-important interview. The next morning reflection came after my prayers. When my aunt sent for me, I found her in a most pleasing mood, with a mass of papers before her, of all forms and sizes; she told me that I had made a conquest of M. Laffarge; that he was quite in love with me, had written to ask my hand, and had sent the most particular information respecting his fortune, his position, and his character. These letters seemed dictated by a warm affection; but the honourable signatures did not permit a thought that they were exaggerated. Letters written to satisfy the fears of a family, about to form the most important engagement for a young female, should be written with reflection, and the greatest veracity, so as not to leave the least doubt. One was from M. de Chanffailles, who, being a near relation of M. Laffarge, and proprietor of large manufactories, was expected to be the best judge and the surest voucher of the pecuniary position of his cousin. The other, from M. de Chauveron, advocate, calling himself the intimate friend and law adviser of the family, was full of pompous details upon the fortune, foundry, and chateau of Glandier, and the most touching description of the domestic affection and devotedness of M. Laffarge's relations. Proprietors assured us of the value of his property. The Curé of Uzerches warranted his morality, and on his knowledge of the human heart, gave a most flattering picture, to the future wife, of the family for which she was to quit her girlish dreams and begin a new life in abundance and joy! All this should have been perfectly cheering, and yet my aunt wanted more. She entreated one of her friends, M. Doublat, to see M. Gauthier, the Deputy of Uzerches, who spoke in the highest terms of the character of M. Laffarge, and gave the most satisfactory guarantees of his affairs. M. Gauthier did not content himself with vague information. Intimately acquainted with M. Laffarge, he looked upon him as his son. His fortune was one of the surest in Limousin. He possessed vast abilities, a generous heart, and the strictest probity. As he ended this brilliant enumeration, he said, "Happy the young woman who confides her happiness to him! had I a daughter, I should be proud to give her to him."

In reading these letters, in listening to these accounts, I dared not speak of the person of M. Laffarge, nor place it as an obstacle beside the great and noble qualities attributed to him. I wished to enter life by making a suitable match. I saw myself beloved by an excellent husband; an orphan, I found a mother, who, kind and affectionate, would soon attach me to her. Shut out from the world a great part of the year, I would live for the friends who should people my solitude, and make myself beloved by the poor workmen who enriched us. Although my aunt was delighted with my inclinations, she did not permit me long *tête-à-têtes* with Dame *Reason*. She kept me continually with her, spoke of my chateau, of the hospitality she intended to claim, and of my visits to Paris. Madame Dulauloy, to whom I also spoke of my marriage, said it would be folly not to accept: in fact, all united to decide me. On Friday my aunt gave an answer, though not positive, at least favourable to M. Laffarge; and when I entered the drawing-room they were conversing of intimate and confidential details, which were not interrupted by my arrival. "You must go to my lawyer," said my aunt, "that you also may receive the necessary information."—"It would be useless," said he, "since I am acquainted with Mdlle. Marie, the question of money has become indifferent to me." I was touched with gratitude at this disinterestedness: I held out my hand to M. Laffarge; he spoke to me of his mother, who would love me as a daughter, and of his future projects:—he told me that Glandier was rather lonely, but that he received a great deal of company, and his affairs bringing him to Paris every spring, he would bring me to see my family. The following day M. Laffarge brought us the accounts of his manufactory; the actual revenues amounted to from thirty to thirty-five thousand francs, and when the new road, which was to open a communication with Uzerches, had put an end to the transport of iron on mules, when the capital that I should bring had permitted an augmentation of the works, this revenue would reach annually at least fifty thousand francs. On Sunday, M. Laffarge came to dine at the Bank; my aunt and he wore a look of mystery as I entered the drawing-room, and showed me the coloured plan of a large and superb manufactory, a lovely chateau, whose blue slates were nearly lost in the blue sky, and whose white terraces descended to the garden, with old-fashioned watersprouts. The opposite side of the chateau was on a level with an orchard, where stood the ruins of an old Carthusian church, a long avenue formed of poplars, and the small river which moved the wheels of the manufactory in its graceful bend, served also as an enclosure to the gardens. I uttered a cry of surprise at this pretty habitation. "It is yours," said my aunt, embracing me, and giving my hand to M. Laffarge, "for, without your consent, we have hastened the preliminaries of the marriage, and the banns have been published this morning." I had a moment's fear—a tear and a smile in my eye; my aunt calmed my emotion with a thousand excellent explanations. She told me that M. Laffarge having been six months absent, was recalled by indispensable business; I ought to be aware that nothing was more odious than those eternal interviews; finally, that M. Laffarge being proud of me, wished me to be present at the great races of Pompadour, where were assembled all the *élite* of several departments, and which took place on the 19th of August. "Have a little mercy," said my aunt, smiling; "he is dying of love and impatience, and I to quit Paris, where I am suffocated, and only remain for your wedding." They discussed the wedding presents. M. Laffarge wished to give me everything of the best; my aunt insisted that he should commit no extravagance; it was a combat of disinterestedness, generous prodigality, and wise forethought, and I, embarrassed with my part, sat down to the piano. After this evening, which was decisive, the days passed in occupations, so that I had not a moment for reflection,—no time to look back on the past, or give a calm thought to the future. The mornings were devoted to the workwomen, who came to try on my *trousseau*, which was charming, and chosen by Madame Dulauloy. At twelve, my aunt seized upon me till dinner-time; she had taken upon herself the exclusive right of forming the *corbeille*, and ransacked every shop and tormented all the *modistes* to find some new article or new form of bonnet, &c. On our return, when M. Laffarge had not accom-

panied us, he came to pass a couple of hours with us; sometimes we went to the theatre, at others my aunt went out to parties: left alone, I wrote to my friends, or made up accounts. Madame de Montbreton wrote to me every day, in order, as she said, to make me understand the happiness awaiting me. Madame de Léautaud was in Artois, at one of her sisters-in-law's. On announcing my marriage, I asked her what I was to do with her diamonds; it was impossible for me to sell them before my marriage, and my speedy departure would prevent me from doing so after. I expressed my regret at being so perfectly useless to her, and also my ardent desire to remit them to her, not to be any longer burthened with such a heavy responsibility. Marie answered immediately, that it was more than ever impossible for her to keep the diamonds, as the searches and suspicions of M. de Léautaud were continually renewed, and she entreated me to take them with me and keep them till the return of Mademoiselle Delvaux, who would facilitate the means of disposing of them. "We shall then be able to write," said she, "without danger, through her;" but until then the greatest prudence was necessary: a letter might be lost or opened. Finally, she recommended me to burn hers immediately; already mine was committed to the flames, which mentioned my marriage and the diamonds. Mad. de Léautaud also told me to make use of the few pearls destined formerly for my wedding present, to speak vaguely to her sister of what she had given me, and without explanation; finally, she asked a thousand questions about my *trousseau*, my *corbeille*, my present happiness, my dreams for the future. Antonine was stupified on learning my approaching marriage; at first very happy, then rather offended at being so late let into the secret. I had much trouble to make her understand that in writing to her the day the banns were published, she was informed as early as myself, since I was not acquainted with M. Laffarge three days beforehand. This news carried joy to Villers-Hellon; my aunt and uncle Collard, saw in it a splendid position for me; and my old servants, my good villagers, almost forgot the 120 leagues in thinking of 30,000 francs per annum. They had one regret, which I shared most heartily, that my future prospects were not blessed among them in their church by their good pastor. Mad. de Martens was at Enghien for her health, M. Laffarge went to pass a day there, and my aunt partook the confidence of her husband, who boasted incessantly of having secured my happiness. My resolution was fully approved by Mad. de Montesquiou, who had come to Paris for her son's examination, and whose tender and wise counsel I was thus enabled to receive; then by Mad. de Valence, who returned from the waters some days before my contract. During those few days she attended to me with that pious solicitude to which she had formerly accustomed me: how deeply was my heart touched by the maternal kindness of my dear grandmother!

Among the most agreeable purchases were the keepsakes I wished to leave the beloved friends of my youth; I had asked for fifty louis in my *corbeille* for that purpose. With what care and pleasure I remembered desires expressed, and resolved to fulfil them. I wished my happiness to be increased by that of those I loved; I lived more in them than in myself. Antonine was rather suffering, though not very near her confinement; I surprised her with a complete set of baby-linen. My aunt Garat, had chosen for me a magnificent veil of English point lace, an object of her admiration; it was found fastened to her bonnet the morning of my wedding. I had a gold head carved for my uncle Garat's stick. My aunt Martens had a bracelet she longed for, Herminie, the wished-for colour box. I sent Mad. Montbreton an emerald *cabochon*, held by two claws of a lion, which formed a pretty ring; as for Mad. de Léautaud, wishing to reconcile her love of jewel animals with my aversion for those kinds of serpents, &c., I had made for her a trimming of buttons of lady-birds, a small insect which the peasants venerate as a prophet of good luck. My maid-servants were not forgotten, and I made many happy hearts in that dear Villers-Hellon, which I was abandoning, and for which I had henceforth but a life of remembrance. In the midst of these occupations, these purchases, I saw little of M. Laffarge, and those moments always passed in making him admire with me his beautiful presents, or in thanking him for some new mark of his attention.

He had learnt that I was fond of the bath; one morning he brought me the plan of a pretty bath-room adjoining my bed-chamber, which was to be ready on my arrival at Glandier. Fearing that a journey by the mail might be two fatiguing for my health, he gave me a charming britschka, and wished to travel post; every morning he sent me the finest flowers. He was full of attention and respect to my family; he had even kind words for the good Lalo, who said with tears in her eyes as he left, "he is as good as he is ugly." Sometimes we spoke of our future manner of living; I questioned him upon his château, his servants, his taste, and that of his mother. He described the furniture of the apartments, the domestics, and it was agreed that I should take with me a good maid-servant. It had been long settled that on my marriage I should take into my service a niece of good Lalo, devoted and faithful like her aunt. During these intimate conversations that I had with M. Laffarge, my aunt received visits in another apartment, read or wrote, and we remained under the guard of my little cousin Gabrielle, who listened to and watched us with the severity of a duenna. If sometimes she was tired of her office, she was always proud of it, and running to her Mama would say, "Be easy, I am here; but you see there is really no amusement: it is not as with M. Tabatie and my sister, who embraced each other in secret in spite of me!" But Gabrielle was very fond of her future cousin, who admired her chattering, and gave her *bons-bons*. She usually perched upon his knee, and said aloud that she thought him quite *à la mode*. One day, being out with my aunt Martens to choose the mounting of a set of turquoises, she made me purchase a heavy ring in dead gold, which she wished me to give my betrothed; there was only the date of our first interview within my name and his own. On entering, we informed my aunt Garat of our purchase, and its destination; she seemed uneasy, and said, "My child, be reasonable: I have something to tell you very natural, but which may annoy you, M. Laffarge is a widower!" It was a thunderbolt to me; I had always attached a sinister idea to a second marriage, and had often said, I should never have the courage to marry a widower, and yet in three days my contract was to be signed! in three days I was to replace the cold bride slumbering in her shroud. My first movement was to break this engagement—my second to burst into tears under the caresses and exhortations of my aunts; they comprehended my amazement and discontent, but considered as folly the despair, amounting to the wish to withdraw my promise. I knew not what to say to excuse myself; my grief was not such as one can avow, but it suffocated me like a warning. * * They had been some time at table when I was obliged to enter with my eyes red from weeping. They had informed M. Laffarge of my chagrin, and I found him pale, silent, and overwhelmed. My aunt Martens made me sit by her, and pressing my hands, murmured, "Courage, my child, courage; be nobly forgetful, pardon an involuntary mystery; you see how he suffers." I called Gabrielle softly, and giving her the ring said, take that to your cousin from me. From that time I rarely regained my usual careless tranquillity; however, I did not endeavour to put off the marriage, my word was sacred. Saturday, 10th of August, at twelve, the lawyers assembled with the male part of the family to fix the articles of the contract. Understanding nothing of law terms, I retired into a recess of the window, and conversed on literature with M. de Chanbine, my old notary, who was there unoccupied, for his originality had made him throw off the yoke of contracts and wills.

A moment's silence warned me that the bargain was concluded—accepted on both sides; and when I was called on to sign the act in which two notarial spirits had employed all their intelligence, the one to sell as dear as possible, the other to buy at the lowest price, a creature made in God's image, the smile of contempt and the blush of shame covered my brow. Antonine, being unwell, was lying upon a couch; I went and sat by her; and we were talking of the pleasures of maternity, which consoled her for her suffering, when they came to inform us it would be impossible to be married on Monday at the *Mairie*, and that it would be necessary to go immediately. Without giving me time to reflect, they dressed me in the best of my *trousseau*, and led me to a carriage. We entered a little dark room, where a clerk, sitting in an iron cage, like the inhabitants of the Garden of Plants, grinned us a gracious reception. He opened a large book, in which the witnesses inscribed their names, and especially their titles: they then led us along dark passages, into a saloon with dirty hangings, surmounted with the *coq gaulois*, where we were gravely received by a fat man in a tricolour scarf, holding a Code in his hand.

Until then I had observed the absurdities that surrounded us, followed mechanically, in a glass, the waving of the large plume that shaded my bonnet, while compliments were addressed to me, to which I paid no attention; but when it was necessary to say *yes*, when quitting that lethargic insensibility, I remembered I was giving my life,—that this pitiful comedy was to chain my thoughts, my heart, and will—the tears I wished to conceal choked me, and I nearly fainted in the arms of my sister. The open air, and new impressions which rapidly succeeded, chased away this sudden emotion. My aunt Garat, who wished to give me time to recover myself, decided that I should be permitted to enjoy my independence, and, saluting me as a married woman, and free, she put me into a one-horse carriage, and told me to enjoy my day as I pleased, without permitting either my sister or M. Laffarge to accompany me. I went first to the flower market; then to St. Roch, where I said a short prayer; then to Madame de Valence, who had company, and was astonished to see me enter alone, enveloped in my matronly cachemire. When alone, I confided to her my marriage, and told her she had my first minute of liberty; that I had desired and obtained, that my marriage should be concealed during two days, that I might remain Mdlle. Cappelle to those who were to come in the evening to sign the contract. I thanked her a thousand times for the magnificent scarf she had sent me in the morning. I remained some time with her: she was highly amused at the marriage secret, and my flight to her. M. Laffarge received me on my return with a beautiful *bouquet* of magnolias and orange flowers. He was kind and attentive all the evening, very forgetful of his new rights, and scarcely pressed my hand openly. There were a great many persons assembled: all wishes, all regards, were for me;—and for the last time I was a gay, happy, thoughtless girl. I would not wear any of the ornaments of my newly-acquired dignity; a muslin dress, some natural daisies in my hair, composed my toilette, and I danced till morning with a light heart, smiling at my friends, smiling at him for whom I was going to leave them. All the next day—Sunday—I was sad, and painfully occupied with preparations for departure. Antonine and my cousins assisted me to pack up the lovely objects of my *trousseau* and *corbeille*; but when our eyes met, the words of regret came to our lips, and tears to our eyes. My good Lalo, who wished to do something that would make me think of her care in my absence, took many pinches of snuff while giving her directions to Clementine, and complained of a cold in her head to excuse her red eyes; and Ursule's regrets were easily guessed as she gave me her good wishes. My dear little room was already in all the disorder of abandonment, encumbered with boxes and cases. I did not wish my girlish sanctuary to be seen in such a plight, when M. Laffarge knocked at the door. I begged and entreated him not to come in; he took no notice of my request. "The hour of ceremony is past," said he, laughing, "and I enter by the husband's right." Taking me roughly by the waist, he would have embraced me; but I was indignant, and rushed to the drawing-room, which was empty, to weep alone. My thoughts were too bitter to write, yet my heart still aches at the remembrance. Antonine soon came after me, bringing M. Laffarge, unhappy and repentant, begging my forgiveness: my mouth gave it, but my heart could not. There are those trifling wounds in life which are nothing in themselves, but profound by the evil they foretel, awake in the heart the echo of misfortune which time alone can heal. It was decided that we should dine at Véry's, and finish the evening at the Circus in the Champs Elysées. Those agile horsemen, who had so often amused me—those gentle animals and hardy grooms—failed to give me pleasure.

After the fatigues of the day, I slept profoundly till my old servant came to bring me a cup of coffee—it was a custom of childhood. She had always offered me the first taste of her breakfast, and pretended it was not good without that little formality. We then felt that she came for the last time to my bedside—that we must bid farewell to all our habits of childish yet pure affection, and our tears fell in abundance. My aunt Garat soon after arrived, only thinking of my toilette; quite proud and preoccupied, she busied herself with the wreath of orange-flowers that was to bind my hair, and did not reckon the beatings of my heart: she feared lest the rich flounces of English point might be torn or rumpled, but dreaded not the failing of my courage at the moment of separation. She was cheered with the thoughts of my future life, happy at my marriage, and could scarcely contain her joy. Antonine wept,—my aunt Martens consoled and advised me. As soon as my toilette was finished, I knelt before my aunt Martens: she placed on my head the orange wreath, then blessed me in the name of my father and mother, and absent friends. M. Laffarge came in: he seemed touched at my emotion, knelt before me, and repeatedly kissed my hand. Melted by these expressions of his love, I begged him to be always kind and indulgent, to love me above every one else, to remember that I was an orphan, in want of affection, and could henceforth only look to him. He promised all, as he kissed my forehead, then led me to the drawing-room, where my friends were assembled. We were married at the Church of the *Petits-Pères*, after a very short mass and a very dry exhortation. Not willing that the world should read the thoughts which swelled my heart, I concealed under my veil my prayers and tears, and I had the reputation of having conducted myself perfectly. After a long and animated breakfast, my aunts shut themselves up with me in the drawing-room, to instruct me in my new duties. Their words made me blush and tremble so, that at last I stopped them with a little untruth, saying I perfectly understood them. However, as I wished to seek rather more in the clouds than in natural history, I kept my theory, which was innocently stupid, my fears, which were terrible, and my firm resolution, to travel day and night, till we reached Glandier. After my aunts' lecture my cousins came to undress me; they unfastened the orange wreath which I divided among the young persons of both sexes, who assisted at the wedding: I kept secretly a bud of this maiden ornament, and enclosed it in a little heart, given by my mother, which never quitted me, I kept it as a talisman. This secret impulse of my heart was blessed.....all the blossoms of youth have been torn or withered—one only escaped profanation under the protection of my patron saint.

M. Laffarge had some business to settle, and some arrangements to make; it was agreed that the post horses should be ordered for four o'clock. After many tears and embraces, I found myself quitting Paris, too much afflicted to think of turning to give a last farewell look. Morning arrived before my eyes were dry, and the fresh breeze as it wafted my veil, imparted a refreshing coolness to my face as I raised the glasses. All nature was awake, singing the praises of God. At first I looked around without reflection; then listened to the song of the postillion, the cracking of his whip, and at last to the questions he put to Clementine about myself, who he thought shed too many tears for a newly made bride. This made me remember I was married, and not very amiable to continue to grieve so long: I turned to look at M. Laffarge, he slept and I began to dream. Till that day, my life, which was isolated in the midst of affections, intimate, but secondary, was then going to become the first spring, the first joy, the first hope of another life! I was going to be loved; the feeling of uselessness which had weighed upon my past life, was to give place to the feeling of duty! and each word, each action might delight the worthy man who had given me his name. M. Laffarge seemed to adore me; I had not yet learnt to love him, but they say that soon comes; love in a *suitable* marriage is rarely more than a tender esteem, and I already felt all that this sentiment inspired. While reason spoke thus, my imagination whispered the delicate words of passion, which were to lull me all that day: the first kiss on my forehead, a second, a third which I should perhaps return; then an arm encircling my waist, a voice saying "I love you," and afterwards with the first star murmuring, "My angel, dost thou love me?"—A sudden jerk of the carriage awoke M. Laffarge; he stretched out his arms with a loud and long yawn, kissed me on both cheeks, and said, "Come, my little wife, to breakfast." There was a cold fowl in the carriage, M. Laffarge seized it by the two wings and tore it in two, then offered me the half; I refused with a little disgust. He thought I was ill, became alarmed, and earnestly begged me to drink a glass of wine, and, on my refusing, drank the whole bottle for "me and himself, who only made one." The odour of this repast was insufferable; I took the place of Clementine outside; I amused myself with talking to the postillion, and endeavoured to dissipate the unfavourable impression of the breakfast. Towards noon I re-entered the carriage; I endeavoured to converse of literature, the theatres, my Villers-Hellon, of its beautiful forests. This last part of the conversation seemed to interest M. Laffarge; but my ignorance of the system of cutting timber, of the price of wood and coal, soon ended my success; he drew out a pocket-book, and busied himself in accounts, which seemed to occupy him more pleasantly. I tried to sleep; the burning sun and the clouds gathering from the east spread over us like a covering of lead, and gave me pains in my head which precluded sleep. Towards five o'clock we reached Orleans; I could scarcely keep myself up, and I begged for a bath in order to seek refreshment and repose. I had scarcely entered the bath when the door was violently shaken. "My mistress is in the bath, said Clementine."—"I know that: open the door."—"But, sir, the bath is uncovered; my mistress cannot receive you."—"Your mistress is my wife: what the devil is the meaning of this ceremony?"—"I entreat you to wait an instant," said I; "in a quarter of an hour I shall be dressed."—"It is just because you are not dressed, that I insist on coming in. Do you take me for a fool? Do you think I will be any longer made the tool of a silly Parisian?"—"I am frightened," whispered Clementine,—then aloud, "Pray, sir, be gallant for the first day."—"Mary, I command you to open the door, or I will burst it open; do you hear?"—"You are free to burst it open if you will; but I will not open it. Force is powerless over my will: know that once for all." After swearing in a manner which made my cheeks turn pale, and which my pen could not repeat, he went away furious. I was horror-struck; my poor Clementine did all in her power to console me, and then went to find M. Laffarge. She tried in vain to show him he was in the wrong, and as she said I was unwell, and that he would kill me with such violence, "Well," said he, "I will be silent this time, but once at Glandier, I will soon bring her to her senses." When I saw M. Laffarge, I did not utter a word: he began by asking if my tricks were over; then seeing my paleness, he became tender and embraced me. I took some tea, and passed an hour on the balcony, comprehending the depth of the abyss into which I had fallen, and dreading to fathom it. The motion of the carriage, the beauty of the night, made me forget for awhile the bitterest of my reflections. I attributed M. Laffarge's violence to passion. This love was different to that of which I had dreamt; I was alarmed, but hoped to conquer by its violence, and as I heard him sleeping, I was re-assured and almost without rancour. In the morning we arrived at Chateauroux, where we were expected by M. Pontier, private receiver of La Châtre. He was an uncle, and the first person I saw of my new family. I wished to please him, and tried to be amiable, and to drive away the clouds which came across my mind. M. Pontier was about fifty years old, of a frank, open countenance, and warm speech. He seemed delighted to see me, paid his nephew a thousand compliments upon me, called me his child so good-naturedly, that I felt disposed to love him at once. His wife was to accompany us to Glandier. She was no longer young; at that age, when, without renouncing all pretensions to youth, people take the tone of another age. She possessed a wit caustic, imperious, spiteful, and unfortunately showed it in her eyes, with honey on her lips. One could never be lonely with her, but one was amused at the expense of good feeling; and after a short walk I took, leaning on M. Pontier's arm, I could perceive he separated from his wife without much regret. They gave us an excellent breakfast. Having occasion to go into my aunt's room, I found her reading the paper while her husband was curling her hair. "Follow my example," said she, seriously; "there is nothing more agreeable than a husband to dress one. M. Pontier dresses hair and laces divinely, and no person knows better how to tie a knot, set off a figure, and put on a shawl." At that moment, this model of husbands wished to place on his wife's neck, a collar slightly tumbled. Madame Pontier, remarking it, said sharply to M. Pontier, that since the morning he had had time enough to iron it; that it was not the first time she had perceived his indifference, and that she was an unhappy woman since the death of her father, having no one to love her but her dog." In the carriage Madame Pontier conversed much upon literature, spoke of the bad taste of Victor Hugo, who would not imitate Racine, of the madness of Alexandre Dumas, of the sublime grandeur of the poets of the Empire, and above all, of the immorality of Madame Sand, who wrote like a cook-maid, and thought like a fish-woman. My charming aunt assured me that no person in La Châtre received *that lady*, that women who respected themselves did not even know her name; for herself, she had just quarrelled with a *sous préfet*, for wishing to lend an infamous work called 'Lelia,' to M. Pontier. I dared to avow having read 'Indiana,' that I admired at least the magical attraction of that beautiful prose, splendid and graceful as a diamond concealed under the leaves of a rose. She raised her eyes to Heaven, and wondered at so much perversity in one so young; began to exercise her wit at the expense of her family, of which she charitably gave me a description, giving each his share of mortal sin.

M. Laffarge being outside, my new aunt wished to gain my confidence. After having flattered my vanity with a thousand exaggerated compliments, she told me I had great courage to quit Paris; that I would be wearied to death at Glandier, between a rough husband and an uneducated mother-in-law. I was offended at the character of Victim which she wished to impose on me, and assured her that I was fond of solitude, that I esteemed my husband, and should take pride in being agreeable, and making myself necessary to him; that I had the promise of being taken every year to Paris to visit my relations. When night brought M. Laffarge into the carriage, his aunt joked him on the eccentric beginning of his honeymoon. He wished to reply victoriously, but, unfortunately, wishing to plead the cause of his love with noisy kisses, I had my mouth torn by this public taking possession; I at first defended myself weakly, then with impatience. Madame Pontier laughed at my prudery, so different from the primitive manners that I was going to meet, and informed me that one of the liveliest customs of Limousin was, to enter the nuptial chamber the first night, to carry the newly married pair a cup of spiced wine, of which they partook in bed. The men's wit was judged by the blushes, more or less, which their jokes brought upon the bride's cheek, or the stifled laughs upon the lips of the women, all eager to see modesty profaned by the gaze of intruders. "Oh! you will not escape, my charming niece," said Madame Pontier, in conclusion, "and I will be the champion of this joyous tradition of old times." "I beg you will do no such thing; I should never be able to endure such a sad pleasantry, and would never forgive a husband who would suffer me to be degraded by such humiliating and immoral gaiety."

I hid my face in my hands, and pretended sleep in order to give myself up to my sad reflections. I shuddered at the relation of such brutal habits. The scene at Orleans rose to my affrighted imagination; I was not only afraid, but disgusted; I looked up to Heaven to the beautiful stars, which seemed to protect me, and counted the hours which were to bring me another night, alas! without stars for me.

We were surprised at Masseré by a violent storm; to the thunder which rolled over our heads succeeded a heavy and continued rain; a thick fog concealed the woods. We saw nothing before us but the white line of the road, the poor horses breathless, and the postillion urging them with a harsh and savage cry, to rouse them from the fatigue of wrestling with the fury of the tempest. At eight in the morning they pointed out to me some dark buildings which formed the faubourg Saint Eulalie at Uzerches; we then

crossed a causeway against which the waves of the Vezere were beating, and alighted at a waggoner's inn, in order to avoid a meeting with a part of the family with whom I was to be at variance, and who inhabited the only passable inn in the place. Madame Pontier quitted me to pay some visits, and M. Laffarge came to inform me that the carriage being broken, we should be obliged to remain some hours. M. Buffière, my brother-in-law, awaited us; he gave me two loud kisses of welcome; a young cousin also came to give his salute of relationship; they then left me, being more eager to see my carriage than to give me a gracious reception. I was ill, fatigued; I wished to lie down; a putrid smell drove me from the alcove where I sought repose. I then placed a chair as far from the dirty walls as possible, and Clementine went to order me a cup of tea. After waiting an hour I was served; there was no teapot, a large water-jug, covered with paper, ingeniously replaced it; some leaves of vulnerary Swiss tea, swimming in the ocean of lukewarm water, usurped the name and place of the Chinese herb, unknown to the Limousins. I opened my window, the rain had ceased, but the fog concealed everything. Suddenly the bells began to ring joyously and lively; every door opened to send forth the pious at the call; it was the fête of *Our Lady of August*, my patron saint. I drew my cloak around me, and was going to carry my sadness to her altar. "That is impossible," said M. Laffarge, whom I had sent for to inform of my project; "everybody will be looking at you, and talking about you."—"That is of no consequence to me."—"I tell you it is impossible; I do not wish you to be seen by my family. They are jealous of my marriage; curiosity must bring them to you; they must not see you till you are in full dress."—"It is very flattering for my poor person. But since you will not allow me to go, I must remain."—"Do not pout, my little puss; it is because I love you that I wish you to dazzle them with your jewels, shawls, &c." I remained alone. Clementine came, and taking my hand, said, with a voice full of emotion, "I wish you much happiness to-day." I could not answer the kind girl; but leaning my head on my hands, burst into tears. What bitter remembrance this fête brought me. Formerly I awoke under the kisses and presents of all my family; my toilette white, the livery of the Virgin, I joined to it the flower given by my grandfather; I went to our little church, confiding and happy. Coming from mass the peasants met me with their wishes and their flowers. All the women embraced me, and the young children; then the men went to continue their wishes over some bottles of wine; the young girls, forgetting the harvest, danced to my health under the lime trees. I was the Queen of the day then. Alas! now a new life was opened to me, and I was alone, without prayers, without flowers, without friends. My God! I exclaimed, have pity upon me. It was nearly eleven o'clock before the carriage was in a fit state to convey us from Uzerches. I was eager to quit it, and drive away my sad thoughts by thinking of my pretty little chateau, and the kind family expecting my arrival. We stopped an hour at Vigeois, with a cousin of M. Laffarge. I was so anxious to arrive *home*, that I suffered myself to be embraced, looked at, and even took some fruit mechanically, without awaking from my painful impressions. Saddle-horses were brought. I was so fatigued that I wished to continue in the carriage, although they declared the roads to be impassable in the wild country which separated us from Glandier. Not a ray of sunshine had smiled upon us since the morning storm. The rain still dripped from the trees, and the torn-up roads obliged our horses to go step by step to avoid continually falling. After three hours' journeying we descended precipitously into a hollow road. They pointed out to me some smoking roofs which peeped above the fog, belonging to the buildings of the foundry, and the carriage stopped at the entrance of a small avenue of poplars. I leaped out of the carriage into the arms of two women; crossed a long dark road, cold and wet; ascended a small staircase of rough stones, dirty and slippery from the rain which came through a broken roof. I at last entered a large room, called a drawing-room for company, and fell into a chair, looking around me with a stupified air. My mother-in-law took my hand, and looked at me with curiosity. Mad. Buffière, a rosy little woman of common appearance and perpetual movement, overwhelmed me with caresses and questions, and wished to arouse my bitter stupefaction, which she mistook for timidity. M. Laffarge came in, and endeavoured to seat me on his knee, and as I repulsed him with a positive refusal, he said aloud, laughing, that I only knew how to pet him when we were alone. "Mamma," added he, "you have no idea how that little *duck* loves me. Come, my dear, own that you love me confoundedly." At the same time, suiting the action to the word, he took me by the waist, pinched my nose, and embraced me. My self-love was fired at these words and actions; I shook with indignation at hearing these loving names which made me so politely one and several animals. Unable any longer to endure this torture, I complained of excessive fatigue, and said I had letters to write. They conducted me to my room, where I shut myself up with Clementine. My room, as large as the drawing-room, was without furniture. Two beds, a table, and four stray chairs, were all that solitude contained. I asked for an ink-bottle: they brought me a broken gallipot, with a bit of cotton and grey water in it. To sleep on the bed was impossible. I endeavoured to write, but could not recall my ideas. I was crushed under the weight of a terrible deception. I recoiled from the thought of so soon giving pain to my friends; my affection refused to impart to them half the anguish I felt. Then a hundred leagues separated us, and many days would elapse before they could come to me... What would become of me during these long days? What must I do—what must I do? The grey tint of the sky, becoming more sombre as the night approached, added to my indignation on finding myself thus deceived, and the fear, the dread of the nocturnal *tête-à-tête*, which I could no longer avoid. I was never revengeful, but when my heart is wounded, I cannot master my indignation. At that moment I should have fainted, had M. Laffarge kissed my hand; in his arms I should have died. Suddenly my resolution was fixed: I determined to quit him, to go to the end of the world rather than remain,—above all, not to pass the night within these dark walls. But the means? My imagination prompted me, and I resolved to obtain from M. Laffarge an order for my departure,—to hurt his pride, his honour; to tell him that I did not like him,—nay, that I loved another, and traitoress to my new ties, had seen his rival at Orleans and at Uzerches; to tell him that all my thoughts had been adulterous since my marriage. I could never have had the courage to say that frightful word, never have dared to speak those humiliating falsehoods; but paper does not blush, and in all the bitterness of my heart I confided to it my deliverance.

After writing several pages, I read over my letter, and was frightened at the energy of it, but felt sure that I was saved. After reading it, they might kill me; but it was impossible they could detain or pardon me. They sent for me to dine. I concealed my letter in my dress, and became quite calm, because my resolve was fixed, and I had the immoveable courage of the warrior who burns his vessels to obtain victory or death. All the family of Glandier was assembled in the dining-room; the dinner was long, the evening still longer. I was pained at the expressions of affection from Madame Laffarge,—the officious attentions of Madame Buffière. I tried to be amiable, and show myself sensible of their kind reception: I regretted to make them feel all I had suffered the last few days.

Each time I felt my cheek grow pale, my courage shrink, as the monotonous ticking of the clock told me the dreaded hour approached: I pressed my letter to my heart, and the rustling of it seemed to me a voice murmuring "I am here, fear not." Ten o'clock struck, M. Laffarge ceased a conversation upon business he had been holding with his brother-in-law more particularly, though the other members of the family joined in: as they spoke *patois* I did not understand them, and this added to my sufferings. Turning to me, he said,—"Come, wife, let us retire;" and drew me to him by placing his arm round my waist. "Permit me, I entreat you, to remain for a few moments alone in my room," I replied.—"Some more foolery; but I will pass it over once more, for the last time." On entering my room, I gave Clementine my letter and begged her to take it to M. Laffarge. When she returned, I fastened the door, and threw myself, sobbing, into her arms. The poor girl was dreadfully frightened, asked me a thousand questions, and I had some difficulty to make her understand what I had done, and my resolution to quit the house. She begged me to wait patiently a few days, and send for my family, and not expose myself to be killed by my husband in a fit of passion. There was a knock at the door: I refused to open, but knelt weeping by my bed. A few moments restored me to myself. I told Clementine to open, and leave me alone: I placed myself in the recess of an open window. M. Laffarge entered in a furious state, addressed to me the most outrageous reproaches, told me that I should not leave, that he wanted a wife, that he was not rich enough to buy a mistress, that, belonging lawfully to him, I should be his. He attempted to lay hold of me; I answered coldly, that I was aware of his rights, he might kill me, but should not degrade me; that if he came any nearer I would jump out of window. Seeing me so pale, and with such desperate firmness, he drew back in affright, and called his mother and sister. They came to me weeping, begging me to have mercy on their poor Charles, for their honour, their existence, which I was going to destroy. M. Laffarge threw himself at my feet, and my firmness gave way before their tears and prayers. I answered that I could easily pardon the odious falsehood of which I was the victim; that I cheerfully abandoned my fortune; that I would always keep the name I bore pure and unsullied, but that I had not the courage to remain; that if they detained me, I was not afraid to die. My sister-in-law, overwhelmed me with caresses and questions; I told her the scene at Orleans, of all I had experienced on the route, and bade her imagine how much I dreaded my arrival and the consequences. She took her brother on one side, and spoke earnestly to him. Mad. Laffarge came in her turn to persuade and calm me; she said how much she would love me, how proud she was of me, that she would be a mother to me, &c.; she begged me to forgive her son, whose love for me and the despair of losing me had been the cause of the deception: told me the country around was rich and beautiful, and only appeared dull on account of the recent storm; that I should be perfect mistress, and change the house according to my tastes and habits, &c. M. Laffarge returned with his sister, kissed my hand, weeping; I did not withdraw it, but begged him to forgive the chagrin I had caused him, to accept my fortune, and suffer me to quit. He explained to me that I could not dispose of my fortune without the consent of my family; entreated me to remain a few days, when if he could not obtain his entire pardon, I should be at liberty to go. I was unable to resist such prayers and tears; I consented to remain some days as a *sister*. M. Laffarge assured me that my will should be a law for him, as he was too happy to see me so good; and Mad. Buffière said, laughing; "Make your mind easy, my little sister; if he is not good, we will take care of you: shall I sleep in your room?" I refused her kindly, but had a bed made up for Clementine. This violent and painful scene so shook my nerves that I fainted, and remained some hours insensible, with my limbs contracted. They would not quit me, thinking I had taken poison. Towards morning, I fell into a profound sleep, and was only awoke by the strong rays of the sun shining into my room. On awaking, I learnt that M. Laffarge was too unwell to leave his room; I sent Clementine to know how he was, then descended to breakfast; the company of the evening before was increased by a friend of the family, an old lawyer, with white hair, gallant manners, with a mode of speaking slow, refined, and sonorous. Sad, and pre-occupied, I at first replied with an ill grace to his attentions, but after a short walk, during which his conversation was amiable and varied, I forgot my grief for a moment, and aroused myself to reply. I found M. Chauveron intellectual, with much good sense, concealed under rather formal manners, which even appeared ridiculous. Even when he spoke of music, he did so with imposing solemnity; he paid a compliment with the austere gravity of a funeral oration; in short, he said good morning with eloquence and asked for a glass of water in a persuasive tone. After his departure, I was presented to M. Pontier, doctor at Uzerches, and uncle to M. Laffarge. He was a man

of about forty, with a noble and intelligent forehead, whose ardent and passionate glance seemed ill at ease under the curtain of white hairs which surrounded it. As soon as he had pressed my hand, before we had exchanged a word, my heart owned him as a friend. He took me to visit the ruins, related their history, their legends, and gave me a touching description of the love which awaited me in my new family, and spoke much of the happiness which I should, perhaps, not find, but which I was destined to spread around me. I interrogated M. Pontier ingeniously upon his nephew's character: he replied with perfect frankness, that M. Laffarge was rude and uncultivated, rough as his mountains; that all his studies had been directed towards the improvement of his manufactories; that he had not much wit, but plenty of good sense; and that his coarse habits might be easily overcome by affection; that M. Laffarge loved me exceedingly, and that no sacrifice would be too great for him in order to gain my affection. Some sad thoughts arising to my lips, M. Pontier knew how to tranquillize them. He described to me my future life, with its duties, its activity, its poetry, sad but gentle; in short, when we returned to the house I had promised him my friendship, and felt stronger in relying upon the protection and affection he offered me. After feeling the pulse of his patient, M. Pontier ordered my presence as a calming potion, and conducted me to M. Laffarge, who was so grateful for the visit that I was more than recompensed. He asked if I had been far from the house—if I had seen the foundry. I told him I had visited the ruins, but waited for him to conduct me to the manufactory, that he might give the explanations indispensable to my ignorance. During the remainder of the day I was calm, almost forgetful of my previous despair; all around me seemed to be the same; a smile on my lips brought pleasure to the eyes of all, and without knowing why, I felt more happy. As Clementine undressed me, she informed me that M. Laffarge had sent for her and told her that he could no longer live without me, that he wished to keep me by surrounding me with all I desired, that he wished to know from her my tastes and habits.

After a long conversation he had charged her to tell me I was perfectly mistress to arrange the house as I pleased, and that if I found it too ugly I could have another built, workmen only waited my orders to obey. When he found that I had not the necessary articles for my bedroom, he sent an express to Uzerches for them, and told me that he was going to write to beg my aunt Garat to send me a man servant that I might not be annoyed by the awkwardness and language of those of the country.

The next morning the weather was so fine, the air so warmly perfumed, that I felt less sad, and wished to walk out and become acquainted with the surrounding scenery. M. Laffarge was quite well; he sent for a small boat, and after many windings through beautiful meadows, the little river led us to the foot of the manufactory. The workmen, warned of our visit, met us with an immense bouquet of wild flowers, and a noisy and cordial welcome, expressive as the idiom of their *patois*; they seemed quite contented with their new mistress, and did not forget to say so. I wished to see and understand everything: M. Laffarge delightedly gave me interesting details about the machinery, the melting and the fabrication of iron. His language, incorrect and embarrassed in a drawing-room, became lively, animated, attractive in his little kingdom of darkness; he seemed well informed and passionately attached to his works, not keeping within the narrow bounds of routine, but seizing every opportunity for amelioration and progress. It was dinner hour at the forge; an immense copper boiling on the flaming scoria, was brought into the middle of the hall, and a young workman, brandishing a monstrous spoon over his head, sign of his functions, poured out a composition of pork and vegetables into bowls half filled with slices of black bread.——

REVIEWS

History of the French Revolution till the Death of Robespierre. By David W. Jobson. Sherwood & Co.

This volume, we are told in an advertisement, "is designed to form part of a History of France from the invasion of Cæsar till the overthrow of Napoleon;" and it is, we suppose, put forth as a feeler, to test the expediency of continuing the work. We prefer, however, considering it as a substantive production; for there are so many circumstances, peculiar in the epoch of which it treats, that the remarks which may be true in reference to what we have before us, will not necessarily be always applicable to an entire history of the country.

The first in importance among these circumstances, is the notoriety of the events. We are already in possession of so many able narratives of the successive developements of the mighty phenomenon, and many of them composed with such industry and ability, that little remains to be done for the subject. Novelty is out of the question; and any additional light that can be thrown on this epoch, must be sought by a critical examination of predecessors, and a more dispassionate and philosophic estimate of the whole, in its relation to morals, politics, and the general history of humanity. These, it will be said, are not small items, nor unworthy the exercise of abilities of the highest order; but their consideration belongs not to the present generation—the point of sight is, as yet, too close for distinct vision.

Of all the nations of Europe, the English, moreover, are the least qualified for the task. Shut up in their island during the more important epochs of the Revolution, they were not, like the continental nations, in personal contact with the actors, and therefore were more open to the influence of passion and of prejudice concerning them: even to the present day, there are few amongst us with strength of mind sufficient to break through the circle of opinions traced round them by their parents, and to enter fairly and honestly into the questions at issue. The French themselves (heated as they have been by deadly contentions for first principles,) have brought more candour, and far more comprehension of intellect, to the narrative of their own story, than the few English writers who have attempted the subject; and it can hardly be denied, that the historiographers of modern France are considerably in advance of our own.

Whoever, therefore, is capable of reading the French language, will prefer consulting the native writers; and another voluminous English work on the subject will almost inevitably be neglected. But though a full and a laborious history of the Revolution can hardly be considered as a desideratum in English literature, it is otherwise with a brief, rapid, and clear summary; and a work like the present, in three hundred and odd pages, if written honestly, and with even moderate ability, will hardly fail to find a satisfactory sale. There are so many amongst us who have their opinions yet to form, and who have not leisure to unravel the conundrums of Carlyle, or to wade through the heavier volumes of Alison, that a text-book of the subject must find popularity, if not wholly unworthy of it.

Having mentioned the small number of pages in Mr. Jobson's volume, it is unnecessary to say, that they cannot be overloaded with unimportant details, nor with lengthy discussions of disputed points; and the style is as condensed as the matter. Indeed, there seems something like an affectation of brevity in the construction of the sentences, which, if it often adds considerably to their weight, not seldom gives to them a roughness, approaching to obscurity.

In treating on the earlier periods of the Revolution, the author has distributed praise and censure with an even eye, except only in the character of Lafayette, of whose abilities he thinks too little; making no allowance for the fetters which a sensitive and jealous honour and high principle must ever cast round the public man, in moments of political crisis. Formed by the American Revolution, in the school of the Washingtons, the Franklins, and the Jeffersons, Lafayette was unprepared for the desperate collisions of interest, and the vehement bursts of passion, incidental to the outbreak of a slavery of centuries' duration. It is, therefore, as a moral, rather than as an intellectual character, that he will shine bright upon posterity;—but he was not a driveller, as Mr. Jobson paints him. Cool, dispassionate, with a retentive memory, and great fixity of purpose, Lafayette would have preserved the constitutional regime, had that been possible. Loyal, frank, and confiding, he hoped to triumph by the agency of the law; but the vices of the court, and those of the people conspired to render the triumph of the law impossible. This Lafayette did not comprehend; and in that mistake lay his unfitness for his position.

In his estimates of character, Mr. Jobson is generally more accurate, and the brevity with which they are touched off, often amounts to the *piquante*. The portrait of Egalité, for instance, is, we apprehend, just, and disposes at once of the supposition that he exercised any real influence on the march of events:—

"Whatever may have been the original views of his partisans, the character of this prince unfitted him alike for the post and the enterprise. Weak, capricious, and inconstant, bold and aspiring to lead the populace one day, docile and subservient to the court the next, he supported the revolution less from public principle than from private resentment, and was dragged by its current instead of guiding its course. His vices and his importance have been equally over-rated. Individually licentious, he had neither the endowments of a demagogue nor the qualities of a conspirator; and though generally enervated by debauchery, he occasionally could display both the dignity of a prince, and the spirit of a man. His immense fortune fomented the revolution; but his torpid nature neutralized the vague ambition he entertained; and Mirabeau, the chief of his adherents, having soon discovered his incompetence, cast him off with the contemptuous exclamation that he was unworthy of a moment's consideration."

The character and pretensions of Necker are thus briefly but cleverly summed:—

"Necker, who never enjoyed the confidence of the king, no longer possessed any influence in the legislature. Equally deserted by the people, in whose esteem a year before he stood so pre-eminent, he was endangered by their hostility on withdrawing from the kingdom; and a decree of the legislature with difficulty secured his retreat to Capet, in Switzerland, in whose obscurity he safely surveyed the future march of that revolution which he contributed to raise, but failed to controul; and passed the remainder of his life without being either pitied by his friends, or feared by his foes. The malediction of a nation pursued him in his flight; but history, whose voice is impartial, must qualify their justice. It must at once own his honesty, and acknowledge his incompetence; assent to the integrity of his motives, and censure the imprudence of his acts. The great error of his life was the duplication of the commons, and neglect to prevent the institution of a single legislative chamber; yet, as already mentioned, it is difficult to discover how the one could have been avoided, or the other averted. The increased importance of the people demanded increased representation, and this could confer no power, except in a congregated legislature, where their numbers should equipoise those of the privileged orders. Beyond this, and his want of decision, Necker's conduct is unimpeachable, and can raise no reprobation, though it will excite no applause. His natural sphere was to direct unimportant affairs of commerce, not to guide great convulsions of men. 'He is,' said an illustrious Scotch philosopher, 'but a man of detail;' yet had he possessed the comprehensive grasp of Sully, he could not have saved the monarchy."

A better estimate of the author's method of treating his subject will be found in the sub-

joined extract, which is part of a summary of the immediate causes and forerunners of the revolution:—

"Though the first of these illustrious men [Voltaire] was a sceptic in religion, the second [Rousseau] a visionary in politics, and the greater part of their followers substituted superficial sophistry for sublime philosophy, they all taught the mind to respect no antiquated institution which reason rejects, and to reject no modern innovation which reason reveres. And as time, which destroys groundless opinions, but confirms rational reflections, had partially corroborated their principles, and left truth established after illusion disappeared, their influence became great; for in the end men of meditation govern the world; and however neglected while living, attain supremacy when dead. Reflection generally gives way to action, and the pen yields to the sword, in present importance; but the lustre of the philosopher brightens when the laurels of the conqueror fade. The power of a writer begins when that of the warrior ends, and though war had for centuries been identified with the national character of France, its inhabitants were now subdued by that mental charm which submits centuries to reason's eye. True philosophy, however, was soon replaced by erring speculation; and the government, through blind confidence in its own stability, or the Machiavellic policy of injuring another state, encouraged the wildest abstract schemes, without surmising their possible application to itself. Liberty in Philadelphia was extolled, while not a vestige existed in Paris: and court minions chaunted hymns to the freedom of another country, who never breathed its air in their own. The conduct of the Court of France during the American Revolution,—so unjust to a kingdom, but so useful to mankind, so treacherous to another sovereign, and so fatal to its own,—recoiled with rapid retribution. In an hour more evil for himself, than for the monarch from whom he helped to wrench a noble realm, the French king concurred with his cabinet in the ungenerous impulse to humble a rival power; and sent assistance to Britain's revolted colonies, without reflecting that by contributing to overturn the throne of a brother sovereign he undermined his own. He discovered with regret, when regret was unavailing, that in aiding to establish one republic he unconsciously laid the foundation of another; and displayed the weakness of a mind, inconsistent, if not insincere, by crushing democracy at home while he fomented it abroad. Foreign treachery is appropriately succeeded by domestic tyranny. In the hour when his court was celebrating the arrival of Franklin, America's illustrious ambassador, he launched an edict to exclude all officers from the army, who could not show nobility for four generations. But this insane attempt was abortive, and only accelerated the revolution it was designed to avert. All rational men received it with indignation; and it was not likely to make the impression desired on the minds of Lafayette and the band of gallant adventurers who shared in the dangers of the American War, and on its termination returned home, ambitious of honour, and deserving of distinction, determined to live in freedom or to die with glory. But though native philosophy and foreign strife excited the inflammable mass, the poverty of the government was the immediate cause of combustion."

In these brief passages there is strength and sagacity; and it cannot be denied that they have considerable graphic power.

In the latter portions of the work, which treat of the Convention, and of the Reign of Terror, the events succeed each other so closely, and are of a nature so appalling, as in some degree to overpower the writer. His course is often too rapid for distinct vision; or it may be, that the meanness and demoralization of the actors left them without assured motives, to state and to illustrate. The whole passes before the mind's eye as a horrid and revolting phantasmagoria, and the writer possibly was more anxious to dismiss the vision, than to analyze its agencies. Still nothing can be more imposing than the picture the author sketches of the gigantic energies of those times, in which, while a band of desperadoes was organizing murder, spoliation, and the most revolting tyranny at home, the nation at large flung itself upon invading Europe, and rolled back the torrent of violence and injustice upon the territories of the combined sovereigns. With anarchy in the capital, confusion in the provinces, a furious civil war raging in the heart of the country, and the frontiers occupied by numerous armies, the nation did not despair; and there were found individuals capable of wielding its force, and of coming out of the contest with triumph and with glory. This period, indeed, presents two very different faces. The attention of the masses has been almost exclusively turned to the more obvious and disgusting features of the Reign of Terror: but the vigour and the resources of those who really conducted the business of the nation, and made head against foreign invasion and domestic bankruptcy, are subjects well worthy of a minute and careful examination. The labours, too, of the Convention, interrupted as they were by internal faction and external violence, present points of interest to the philosopher and politician. With respect even to the Terrorists themselves, it is not to be forgotten that they were influenced by circumstances not to be overlooked. While it is very certain that these monsters acted after their kind, it is by no means sure that they were not also governed in some degree by a blind instinct of the necessities of the national position. It may at least be reasonably doubted, whether with less fanaticism the people could have made head against their foreign enemies, and whether the movements of the guillotine did not contribute largely to the victories on the frontier.

Whatever infamy may attach itself to the memory of the Terrorists, (and their deeds were too dreadful to be calmly discussed,) a still more important truth for posterity is, that they alone were not to blame. The *lachesse* of those who were treacherous to the Constitution, who jeopardized the monarchy by their intrigues, and then, by a cowardly flight from the country, abandoned it into the hands of an insulted and irritated people, were as efficient causes of the dreadful catastrophe, as the vices and insanity of the immediate agents.

In a summary like Mr. Jobson's, these matters could not be fully canvassed; but they are essential portions of any History of France, which will satisfy posterity.

An Epitome, Historical and Statistical, descriptive of the Royal Naval Service of England. By E. Miles, with the assistance of Lieut. Lawford Miles, R.N. Ackermann.

Our difficulty as to the class of persons for whom this prettily illustrated volume was designed, is explained by the statement in the preface, that its object "is, to present to the general reader, and those who may be intended for the nautical profession, a concise, yet comprehensive, view of each and every department of the Royal Naval Service of England." But we fear that it requires a more intimate acquaintance with a ship, and the details belonging to one, than "general readers" usually possess, to understand the numerous technical terms which occur, unless they refer to a glossary or marine dictionary.

The work, therefore, labours under the defect of requiring much previous knowledge in the persons whom it intends to instruct; but to those who possess that knowledge, or will take the trouble to obtain it from other sources, it contains much curious and valuable information. The volume commences with an "Historical Outline of the British Navy," from the earliest period, and describes each class of ship, and the manner of building, fitting her for sea, her stores, guns, ammunition, provisions, &c., together with the general economy established for the government of the officers and crew. Then follows an account of the "Civil department of the Navy, of the Admiralty Office, Naval yards, establishments for victualling, for providing medical stores, transports, &c., of Greenwich Hospital, and the *personnel* of the Navy,—under which head the various ranks, pay, uniform, privileges, pensions, and, in short, everything relating to officers and seamen is noticed. Towards the end Mr. Miles gives some account of the flags, pendants, and ensigns used in the Navy, Orders of Knighthood, salutes, and estimated expenditure. It can scarcely be necessary to observe, that in a book of only 185 pages, some of those subjects must be discussed in a very superficial manner; and should it arrive at a second edition, the author would do well to revise and enlarge many parts, making room for improvements by discarding the eternal scraps of poetry, which are not merely out of place, but are often the veriest *original* doggrel we ever met with. Another sin of the work is its absurdly inflated style. If simplicity and clearness of language are ever to be expected, it is surely in a book relating to the Navy, superintended, if not written, by a sailor, and addressed to young naval officers. Can anything, for example, be more inconsistent than such passages as "ere long the slight canoe wafted its enterprising constructors from island to island, while commerce and civilization, seated in the prow, hailed the new risen light which blessed our aqueous world;" !!! or, speaking of the Nautilus, "whose pearly bark once glided in solitary beauty over the heaving billows of the broad Atlantic;" !!! or than to describe the ancient galley as a ship's "ancestral ruler of the seas" !!! To call things by their right names would seem to have been thought undignified, for the custom of raising or touching the hat on coming upon the quarter deck, though properly enough called "the customary salute" in the text, is explained in a note to be an "obeisance," as if Jack, on such occasions, made a dancing-master's bow! The recent launch of the *Trafalgar*, and the interest generally felt in the Navy, induce us to extract the following details, which cannot, however, be understood, without first allowing Mr. Miles to describe the different "rates":—

"*First Rate*—All three decked ships.—*Second Rate*—One of Her Majesty's yachts, and all two decked ships whose war complements consist of seven hundred men and upwards.—*Third Rate*—The other Royal yachts, and all yachts bearing the flag or pendant of an admiral, or captain superintendent of a dockyard; and all ships whose complements are under seven hundred, and not less than six hundred.—*Fourth Rate*—Whose complements are under six hundred, and not less than four hundred.—*Fifth Rate*—Whose complements are under four hundred, and not less than two hundred and fifty.—*Sixth Rate*—Under two hundred and fifty.—*Steam Vessels* (of four classes) are assigned a rate at the discretion of the Lords of the Admiralty. Ships or vessels fitted as troop ships, surveying ships, fire ships, hospitals, store ships, victuallers, or for any other temporary service, are also given a rate above the fourth."

"Number of men required to build a first rate ship in twelve months—160 in time of peace; in war time 200. To furnish her aloft, it will take 20 riggers 300 hours, or 30 days at 10 hours per day. The rates per ton for labour (as given by Mr. Edye, to whose elaborate and valuable 'Calculations' we are chiefly indebted for the items contained in the foregoing abstract)—shipwrights, 4*l.* 13*s.* 5½*d.*; caulkers, 4*s.* 11*d.*; joiners, 12*s.* 7*d.*; smiths, 7*s.* 6½*d.*; painters, 1*s.* 8*d.*—Total rate per ton, 6*l.* 0*s.* 2*d.*; the whole cost of labour amounting to 15,643*l.* *Materials*, including oak, fir, and elm timber; iron knees, bolts, and nails; copper sheathing, lead, pitch, tar, paint, and oakum, 29*l.* 18*s.* 7*d.* per ton—making the total amount for ship's hull, 93,521*l.*; masts, yards, and blocks, 6,873*l.*; furniture and sea stores, 16,805*l.* Total expense of ship and equipment, exclusive of provisions, 117,199*l.*"

"Number of men required to build a second rate

ship in twelve months (in time of peace), 122¼. To furnish her aloft 20 riggers for 285 hours. Rate per ton for labour—shipwrights and artificers, 5*l.* 5*s.* Materials, 23*l.* 7*s.* 9*d.* per ton. Cost of ship's hull, 65,279*l.*; masts, yards, rigging, and blocks, 6,503*l.*; furniture and sea stores, 15,114*l.* Total expense of ship and equipment, exclusive of provisions, 86,896*l.*"

"Number of men required to build a third rate ship in twelve months (in time of peace), 97. To furnish her aloft, 20 riggers for 285 hours. Rate per ton for labour, 5*l.* 10*s.* 5*d.* Materials, 28*l.* 0*s.* 3*d.* per ton. Cost of ship's hull, 58,388*l.*; masts, yards, rigging, and blocks, 5,685*l.*; furniture and sea stores, 12,433*l.* Total expense of ship and equipment, exclusive of provisions, 76,506*l.*

"Number of men required to build a fourth rate ship in twelve months (in time of peace), 69. To furnish her aloft will occupy 20 riggers 260 hours. Rate per ton for labour, 4*l.* 17*s.* 5*d.* Materials, 20*l.* 3*s.* 2*d.* per ton. Cost of ship's hull, 36,744*l.*; masts, yards, rigging, and blocks, 4,611*l.*; furniture and sea stores, 9,512*l.* Total expense of ship and equipment, exclusive of provisions, 50,867*l.*"

"Number of men required to build a fifth rate ship in twelve months (in time of peace), 60¾. To furnish her aloft will occupy 20 riggers for 230 hours. Rate per ton for labour, 5*l.* 11*s.* 5*d.* Materials, 20*l.* 18*s.* 5*d.* per ton. Cost of ship's hull, 28,163*l.*; masts and yards, rigging and blocks, 3,153*l.*; furniture and sea stores, 7,952*l.* Total expense of ship and equipment, exclusive of provisions, 39,268*l.*"

"Number of men required to build a sixth rate ship—burthen 500 tons—in twelve months (during peace), 35½. To furnish her aloft will occupy 20 riggers for 140 hours. Rate per ton for labour, 7*l.* 0*s.* 4*d.* Materials 24*l.* 4*s.* 1*d.* per ton. Cost of ship's hull, 15,611*l.*; masts, yards, rigging, and blocks, 1,509*l.*; furniture and sea stores, 4,434*l.* Total expense of ship and equipment, exclusive of provisions, 21,554*l.*"

"Cost of a first class steam-vessel, as Cyclops, 1,195 tons burthen:—Engines and boilers, 22,662*l.* Total cost, exclusive of provisions, when armed and equipped for sea, 54,024*l.*"

"Number of men required to build a 16 gun brig of 382 tons burthen in twelve months (during peace), 22¼. To furnish her aloft, 20 riggers for 105 hours. Rate per ton for labour, 5*l.* 16*s.* 10*d.* Materials, 17*l.* 13*s.* 9*d.* per ton. Cost of hull, 8,992*l.*; masts, yards, rigging, and blocks, 1,136*l.*; furniture and sea stores, 3,285*l.* Total expense of vessel and equipment, exclusive of provisions, 13,413*l.*"

"Number of men required to build a brig of 235 tons in twelve months, during peace, 14¼. To furnish her aloft, 20 riggers for 80 hours. Rate per ton for labour, 5*l.* 18*s.* 9*d.* Materials, 19*l.* 11*s.* 9*d.* per ton. Cost of vessel's hull, 5,999*l.*; masts, yards, rigging, and blocks, 722*l.*; furniture, and sea stores, 2,075*l.* Total expense of vessel and equipment, exclusive of provisions, 8,796*l.*"

Mr. Miles also gives every particular respecting the size and weight of the masts, yards, sails, anchors, &c. of each class of ship, also the number of their respective officers and crew; and the useful little volume is illustrated by eight coloured prints, representing a ship of every class, each in a different position, and also engravings of the various ensigns and flags; but he gives no information respecting their history, nor even points out the difference between the ensigns, &c. used in the Royal Navy from those appropriated to the royal yacht squadron and to merchant ships.

Incidents of Travel in Central America, Chiapas, and Yucatan. By John L. Stephens.

[Concluding Notice.]

When promising one more notice of these delightful volumes, we warned our readers that to give any account of their contents, were the connecting narrative ever so slight, was put out of our power, by their exceeding richness of matter. What remains to us, then, is the selection of a few insulated pictures and adventures, and our heartiest recommendation to the public to welcome Mr. Stephens as he deserves. Sans further preamble, then, we make our bow to him, and proceed to his book.

A Volcano.—"I resolved to give one day to the Volcano of Masaya. For this purpose I sent a courier ahead to procure me a guide up the volcano, and did not get off till eleven o'clock. At a short distance from the city we met a little negro on horseback, dressed in the black suit that nature made him, with two large plantain leaves sewed together for a hat, and plantain leaves for a saddle. At the distance of two leagues we came in sight of the volcano, and at four o'clock, after a hot ride, entered the town, one of the oldest and largest in Nicaragua, and though completely inland, containing, with its suburbs, a population of twenty thousand. We rode to the house of Don Sabino Satroon, who lay, with his mouth open, snoring in a hammock; but his wife, a pretty young half-blood, received me cordially, and with a proper regard for the infirmities of an old husband and for me, did not wake him up. All at once he shut his mouth and opened his eyes, and gave me a cordial welcome. Don Sabino was a Colombian, who had been banished for ten years, as he said, for services rendered his country; and having found his way to Masaya, had married the pretty young half-breed, and set up as a doctor. Inside the door, behind a little stock of sugar, rice, sausages, and chocolate, was a formidable array of jars and bottles, exhibiting as many colours and as puzzling labels as an apothecary's shop at home. I had time to take a short walk around the town, and turning down the road, at the distance of half a mile came to the brink of a precipice, more than a hundred feet high, at the foot of which, and a short distance beyond, was the Lake of Masaya. The descent was almost perpendicular, in one place by a rough ladder, and then by steps cut in the rock. I was obliged to stop while fifteen or twenty women, most of them young girls, passed. Their water-jars were made of the shell of a large gourd, round, with fanciful figures scratched on them, and painted or glazed, supported on the back by a strap across the forehead, and secured by fine net-work. Below they were chattering gaily, but by the time they reached the place where I stood they were silent, their movements very slow, their breathing hard, and faces covered with profuse perspiration. This was a great part of the daily labour of the women of the place, and in this way they procured enough for domestic use; but every horse, mule, or cow was obliged to go by a circuitous road of more than a league for water. Why a large town has grown up and been continued so far from this element of life, I do not know. The Spaniards found it a large Indian village, and as they immediately made the owners of the soil their drawers of water, they did not feel the burden: nor do their descendants now. In the meantime my guide arrived, who, to my great satisfaction, was no less a personage than the alcalde himself. The arrangements were soon made, and I was to join him the next morning at his house in Nindiri. I gave my mules and Nicolas a day's rest, and started on Don Sabino's horse, with a boy to act as guide and to carry a pair of alforgas with provisions. In half an hour I reached Nindiri, having met more people than on my whole road from San José to Nicaragua. The alcalde was ready, and in company with an assistant, who carried a pair of alforgas with provisions and a calabash of water, all mounted, we set out. At the distance of half a league we left the main road, and turned off on a small path in the woods on the left. We emerged from this into an open field covered with lava, extending to the base of the volcano in front and on each side as far as I could see, black, several feet deep, and in some places lying in high ridges. A faint track was beaten by cattle over this plain of lava. In front were two volcanoes, from both of which streams of lava had run down the sides into the plain. That directly in front my guide said was the Volcano of Masaya. In that on the right, and farthest from us, the crater was broken, and the great chasm inside was visible. This he said was called Ventero, a name I never heard before, and that it was inaccessible. Riding toward that in front, and crossing the field of lava, we reached the foot of the volcano. Here the grass was high, but the ground was rough and uneven, being covered with decomposed lava. We ascended on horseback until it became too steep for the horses to carry us, and then dismounted, tied them to a bush, and continued on foot. I was already uneasy as to my guides' knowledge of localities, and soon found that they were unwilling or unable to endure much fatigue. Before we were half way up they disencumbered themselves of the water-jar and provisions, and yet they lagged behind. The alcalde was a man about forty, who rode his own horse, and being a man of consequence in the town, I could not order him to go faster; his associate was some ten years older, and physically incapable; and seeing that they did not know any particular path, I left them and went on alone. At eleven o'clock, or three hours from the village of Nindiri, I reached the high point at which we were aiming; and from this point I expected to look down into the crater of the volcano; but there was no crater, and the whole surface was covered with gigantic masses of lava, and overgrown with bushes and scrub trees. I waited till my guides came up, who told me that this was the Volcano of Masaya, and that there was nothing more to see. The alcalde insisted that two years before he had ascended with the cura, since deceased, and a party of villagers, and they all stopped at this place. I was disappointed and dissatisfied. Directly opposite rose a high peak, which I thought, from its position, must command a view of the crater of the other volcano. I attempted to reach it by passing round the circumference of the mountain, but was obstructed by an immense chasm, and returning, struck directly across. I had no idea what I was attempting. The whole was covered with lava lying in ridges and irregular masses, the surface varying at every step, and overgrown with trees and bushes. After an hour of the hardest work I ever had in my life, I reached the point at which I aimed, and, to my astonishment, instead of seeing the crater of the distant volcano, I was on the brink of another. * * The crater was about a mile and a half in circumference, five or six hundred feet deep, with sides slightly sloping, and so regular in its proportions that it seemed an artificial excavation. The bottom was level, both sides and bottom covered with grass, and it seemed an immense conical green basin. There were none of the fearful marks of a volcanic eruption; nothing to terrify, or suggest an idea of el infierno; but, on the contrary, it was a scene of singular and quiet beauty. I descended to the side of the crater, and walked along the edge, looking down into the area. Toward the other end was a growth of arbolitos or little trees, and in one place no grass grew, and the ground was black and loamy, like mud drying up. This was perhaps the mouth of the mysterious well that sent up the flame, which gave its light a 'considerable distance,' into which the Indian maidens were thrown, and which melted the monk's iron bucket. Like him, I felt curious to 'know what was below;' but the sides of the crater were perpendicular. Entirely alone, and with an hour's very hard work between me and my guides, I hesitated about making any attempt to descend, but I disliked to return without. In one place, and near the black earth, the side was broken, and there were some bushes and scrub trees. I planted my gun against a stone, tied my handkerchief around it as a signal of my whereabout, and very soon was below the level of the ground. Letting myself down by the aid of roots, bushes, and projecting stones, I descended to a scrub tree which grew out of the side about half way from the bottom, and below this it was a naked and perpendicular wall. It was impossible to go any farther. I was even obliged to keep on the upper side of the tree, and here I was more anxious than ever to reach the bottom; but it was of no use. Hanging midway, impressed with the solitude and the extraordinary features of a scene upon which so few human eyes have ever rested, and the power of the great Architect who has scattered his wonderful works over the whole face of the earth, I could not but reflect, what a waste of the bounties of Providence in this favoured but miserable land! At home this volcano would be a fortune; with a good hotel on top, a railing round to keep children from falling in, a zigzag staircase down the sides, and a glass of iced lemonade at the bottom. Cataracts are good property with people who know how to turn them to account. Niagara and Trenton Falls pay well, and the owners of volcanoes in Central America might make money out of them by furnishing facilities to travellers. This one could probably be bought for ten dollars, and I would have

given twice that sum for a rope and a man to hold it. Meanwhile, though anxious to be at the bottom, I was casting my eyes wistfully to the top. The turning of an ankle, breaking of a branch, rolling of a stone, or a failure of strength, might put me where I should have been as hard to find as the government of Central America. I commenced climbing up, slowly and with care, and in due time hauled myself out in safety."

The next scene is one (the shortest) among many scenes of revolution and terror, in which Mr. Stephens was compelled to bear a part. The strife was at its highest between Carrera and Morazan; and the latter was hourly expected at Aquachapa.

"It was nearly dark when we entered the town, the frontier of the state and the outpost of danger. All were on the tiptoe of expectation for news from Guatimala. Riding through the plaza, we saw a new corps of about two hundred 'patriot soldiers,' uniformed and equipped, at evening drill, which was a guarantee against the turbulence we had seen in Izalco. Colonel Angoula, the commandant, was the same who had broken up the band of Rascon. Every one we met was astonished at our purpose of going on to Guatimala, and it was vexatious and discouraging to have ominous cautions perpetually dinned into our ears. We rode to the house of the widow Padilla, a friend of Don Saturnino, whom we found in great affliction. Her eldest son, on a visit to Guatimala on business, with a regular passport, had been thrown into prison by Carrera, and had then been a month in confinement; and she had just learned, what had been concealed from her, that the other son, a young man just twenty-one, had joined Morazan's expedition. Our purpose of going to Guatimala opened the fountain of her sorrows. She mourned for her sons, but the case of the younger seemed to give her most distress. She mourned that he had become a soldier; she had seen so much of the horrors of war; and, as if speaking of a truant boy, begged us to urge General Morazan to send him home. She was still in black for their father, who was a personal friend of General Morazan, and had, besides, three daughters, all young women, the eldest not more than twenty-three, married to Colonel Molina, the second in command; all were celebrated in that country for their beauty; and though the circumstances of the night prevented my seeing much of them, I looked upon this as one of the most ladylike and interesting family groups I had seen in the country. Our first inquiry was for mules. Colonel Molina, the son-in-law, after endeavouring to dissuade us from continuing, sent out to make inquiries, and the result was that there were none to hire, but there was a man who had two to sell, and who promised to bring them early in the morning. We had vexations enough without adding any between ourselves; but, unfortunately, the captain and Don Saturnino had an angry quarrel, growing out of the breaking down of the mules. I was appealed to by both, and in trying to keep the peace came near having both upon me. The dispute was so violent that none of the female part of the family appeared in the sala, and while it was pending Colonel Molina was called off by a message from the commandant. In half an hour he returned, and told us that two soldiers had just entered the town, who reported that Morazan had been defeated in his attack on Guatimala, and his whole army routed and cut to pieces; that he himself, with fifteen dragoons, was escaping by the way of the coast, and the whole of Carrera's army was in full pursuit. The soldiers were at first supposed to be deserters, but they were recognized by some of the town's people; and after a careful examination and calculation of the lapse of time since the last intelligence, the news was believed to be true. The consternation it created in our little household cannot be described. Morazan's defeat was the death-knell of sons and brothers. It was not a moment for strangers to offer idle consolation, and we withdrew. Our own plans were unsettled; the very dangers I feared had happened; the soldiers, who had been kept together in masses, were disbanded to sweep every road in the country with the ferocity of partisan war. But for the night we could do nothing. Our men were already asleep, and, not without apprehensions, the captain and I retired to a room opening upon the courtyard. Don Saturnino wrapped himself in his poncha and lay down under the corridor. None of us undressed, but the fatigue of the day had been so great that I soon fell into a profound sleep. At one o'clock we were roused by Colonel Molina shouting in the doorway 'La gente vienne!' 'The people are coming!' His sword glittered, his spurs rattled, and by the moonlight I saw men saddling horses in the courtyard. We sprang up in a moment, and he told us to save ourselves; 'la gente' were coming, and within two hours' march of the town. My first question was, What had become of the soldiers? They were already marching out; everybody was preparing to fly; he intended to escort the ladies to a hiding place in the mountains, and then to overtake the soldiers. I must confess that my first thought was 'devil take the hindmost,' and I ordered Nicolas, who was fairly blubbering with fright, to saddle for a start. The captain, however, objected, insisting that to fly would be to identify ourselves with the fugitives; and if we were overtaken with them we should certainly be massacred. Don Saturnino proposed to set out on our journey, and go straight on to a hacienda two leagues beyond; if we met them on the road we would appear as travellers; in their hurry they would let us pass; and, at all events, we would avoid the dangers of a general sacking and plunder of the town. I approved of this suggestion; the fact is, I was for anything that put us on horseback; but the captain again opposed it violently. Unluckily, he had four large, heavy trunks containing jewelry and other valuables, and no mules to carry them. I made a hurried but feeling comment upon the comparative value of life and property; but the captain said that all he was worth in the world was in those trunks; he would not leave them; he would not risk them on the road; he would defend them as long as he had life; and, taking them up one by one from the corridor, he piled them inside of our little sleeping-room, shut the door, and swore that nobody should get into them without passing over his dead body. Now I, for my own part, would have taken a quiet stripping, and by no means approved this desperate purpose of the captain's. The fact is, I was very differently situated from him. My property was chiefly in horseflesh and muleflesh, at the moment the most desirable thing in which money could be invested; and with two hours' start, I would have defied all the Cachurecos in Guatimala to catch me. But the captain's determination put an end to all thoughts of testing the soundness of my investment; and perhaps, at all events, it was best to remain. I entered the house, where the old lady and her daughters were packing up their valuables, and passed through to the street. The church bells were tolling with a frightful sound, and a horseman, with a red banneret on the point of his lance, was riding through the streets warning the inhabitants to fly. Horses were standing before the doors saddled and bridled, and all along men were issuing from the doors with loads on their backs, and women with packages and bundles in their hands, and hurrying children before them. The moon was beaming with unrivalled splendour; the women did not scream, the children did not cry; terror was in every face and movement, but too deep for utterance. I walked down to the church; the cura was at the altar, receiving hurried confessions and administering the sacrament; and as the wretched inhabitants left the altar they fled from the town. I saw a poor mother searching for a missing child; but her friends in hoarse whispers, said, 'La gente vienne!' and hurried her away. A long line of fugitives, with loaded mules interspersed, was moving from the door of the church, and disappearing beneath the brow of the hill. It was the first time I ever saw terror operating upon masses, and I hope never to see it again. I went back to the house. The family of Padilla had not left, and the poor widow was still packing up. We urged Colonel Molina to hasten; as commandant, he would be the first victim. He knew his danger, but in a tone of voice that told the horrors of this partisan war, said he could not leave behind him the young women. In a few moments all was ready; the old lady gave us the key of the house, we exchanged the Spanish farewell with a mutual recommendation to God, and sadly and silently they left the town. Colonel Molina remained a moment behind. * * On the steps of the church were sick and infirm old men and children, and the cura's house was thronged with the same helpless beings. Except these, we were left in sole possession of the town. It was not yet an hour since we had been roused from sleep. * * We returned to the house, smoked, and waited in anxious expectation. The enemy did not come, the bell ceased its frightful tolling, and after a while we began to wish they would come, and let us have the thing over. We went out, and looked, and listened; but there was neither sound nor motion. We became positively tired of waiting; there were still two hours to daylight; we lay down, and, strange to say, again fell asleep."

We regret to pass unnoticed the ruins of Palenque, among which Mr. Stephens and Mr. Catherwood pitched their tent for some weeks of the rainiest of all rainy seasons. The following cabinet picture is merely taken because it is of a different class of subject from any we have heretofore exhibited:—

"It was my third Sunday in the village, and again it was emphatically a day of rest. In the afternoon a mournful interruption was given to the stillness of the place by the funeral of a young Indian girl, once the pride and beauty of the village, whose portrait Mr. Waldeck had taken to embellish his intended work on Palenque. Her career, as often happens with beauty in higher life, was short, brilliant, and unhappy. She had married a young Indian, who abandoned her and went to another village. Ignorant, innocent, and unconscious of wrong, she was persuaded to marry another, drooped, and died. The funeral procession passed our door. The corpse was borne on a rude bier, without coffin, in a white cotton dress, with a shawl over the head, and followed by a slender procession of women and children only. I walked beside it, and heard one of them say, 'bueno Christiano, to attend the funeral of a poor woman.' The bier was set down beside the grave, and in lifting the body from it the head turned on one side, and the hands dropped; the grave was too short, and as the dead was laid within the legs were drawn up. Her face was thin and wasted, but the mouth had a sweetness of expression which seemed to express that she had died with a smile of forgiveness for him who had injured her. I could not turn my eyes from her placid but grief-worn countenance, and so touching was its expression that I could almost have shed tears. Young, beautiful, simple, and innocent, abandoned and dead, with not a mourner at her grave. All seemed to think that she was better dead; she was poor, and could not maintain herself. The men went away, and the women and children with their hands scraped the earth upon the body."

Our last extract (we have room for no more) shall describe a coach-maker's establishment at Yucatan. At this stage of our travellers' journey, they were clear of revolutionary stir and turmoil; they were clear, too, of mud roads and savage hosts, being conducted from hacienda to hacienda, and, as the reader will see, treated thoroughly *en prince*.

"It would have been a great satisfaction to pass several days at this lordly hacienda; but not expecting anything to interest us on the road, we had requested Donna Joaquina to hurry us through, and the servant told us that the señora's orders were to conduct us to another hacienda of the family, about two leagues beyond, to sleep. At the moment we were particularly loth to leave, on account of the fatigue of the previous ride. The servant suggested to the major-domo llamar un coché; in English, to 'call a coach,' which the latter proposed to do if we wished it. We made a few inquiries, and said unhesitatingly and peremptorily, in effect, 'Go call a coach, and let a coach be called.' The major-domo ascended by a flight of stone steps outside to the belfry of the church, whither we followed him; and, turning around with a movement and tone of voice that reminded us of a Mussulman in a minaret calling the faithful to prayers, he called for a coach. The roof of the church, and of the whole pile of buildings connected, was of stone cemented, firm and strong as a pavement. The sun beat intensely upon it, and for several minutes all was still. At length we saw a single Indian trotting through the woods toward the hacienda, then two together, and

in a quarter of an hour there were twenty or thirty. These were the horses; the coaches were yet growing on the trees. Six Indians were selected for each coach, who, with a few minutes' use of the machete, cut a bundle of poles, which they brought up to the corridor to manufacture into coaches. This was done, first, by laying on the ground two poles about as thick as a man's wrist, ten feet long and three feet apart. These were fastened by cross-sticks tied with strings of unspun hemp, about two feet from each end; grass hammocks were secured between the poles, bows bent over them and covered with light matting, and the coaches were made. We placed our ponchas at the head for pillows, crawled inside, and lay down. The Indians took off little cotton shirts covering the breast, and tied them around their petates as hatbands. Four of them raised up each coach, and placed the end of the poles on little cushions on their shoulders. We bade farewell to the major-domo and his wife, and, feet first, descended the steps and set off on a trot, while an Indian followed leading the horses. In the great relief we experienced we forgot our former scruples against making beasts of burden of men. They were not troubled with any sense of indignity or abasement, and the weight was not much. There were no mountains; only some little inequalities which brought the head lower than the heels, and they seldom stumbled. In this way they carried us about three miles, and then laid us down gently on the ground. Like the Indians in Merida, they were a fine-looking race, with a good expression of countenance, cheerful, and even merry in their toil. They were amused at us because we could not talk with them."

It is positively grievous to quit a store, so brimful to overflowing of the things we like best. The sooner a second edition gives us an excuse for returning to these 'Incidents' the better.

List of New Books.—Burgh's (the Rev. W.) Lectures on the Second Advent, 3rd edit. 12mo. 5*s.* cl.—Cobbin's (Ingram) Classical English Vocabulary, 3rd edit. 12mo. 3*s.* roan, lettered.—Holt's (H.) The Genius of the French Language Displayed, new edit. 12mo. 3*s.* cl., the Key, 3*s.* cl., the two bound together, 12mo. 6*s.* cl.—Nugent's Pocket French and English Dictionary, in 2 parts, by J. C. Tarver, new edit. square, 5*s.* 6*d.* bd.—Manuel Epistolaire, new edit. 12mo. 6*s.* roan, lettered.—Adolphus's (John) History of the Reign of George the Third, Vol. IV. 8vo. 14*s.* cl.—An Essay on the Government of Dependencies, by G. C. Lewis, Esq. 8vo. 12*s.* bds.—The Art of being Happy, by the Rev. B. H. Draper, new edit. royal 18mo. 3*s.* 6*d.* cl.—Dodd's Parliamentary Companion, royal 32mo. 4*s.* 6*d.* gilt, bd.—History of the Western Empire, by Sir Robert Comyn, 2 vols. demy 8vo. 30*s.* cl.—Hand-Book for Travellers: Birmingham and London and Grand Junction Railways, 18mo. plain, 3*s.* 6*d.* cl.; coloured, 4*s.* 6*d.* cl.—Moore's Poetical Works, Vol. X. 12mo. 5*s.* cl.—Emerson's Essays, with Preface, by Carlyle, 12mo. 10*s.* cl.—Sir W. Scott's Tales of a Grandfather, 8vo. 12*s.* cl.—Sir W. Scott's Prose Works, Vol. III. "Tales of a Grandfather," 8vo. 12*s.* cl., Vol. I. 8vo. 20*s.* cl.—Waverley Novels, Vol. I. 8vo. 20*s.* cl.—Hurwitz's Hebrew Grammar, new edit. 8vo. 17*s.* cl.—Turner's Chemistry, "The Oily Acids," forming the first supplement, 8vo. 4*s.* swd.—M'Crie's (the Rev. Thomas) Sketches of Scottish Church History, 12mo. 6*s.* 6*d.* cl.—Anderson's (the Rev. R.) Exposition of St. John's Gospel, Vol. I. 12mo. 7*s.* cl.—The Church Service, arranged for Chanting, by Dr. Farman, 18mo. 3*s.* cl.—Finch's (Thos.) The True Church viewed in Contrast with Modern High-Churchism, 12mo. 3*s.* 6*d.* cl.—Forster's Sermons, with a Sketch of his Life, by the Rev. John Ely, crown 8vo. 8*s.* cl.

THE HOUSE OF CLOUDS.

BY ELIZABETH B. BARRETT.

I would build a cloudy house
For my thoughts to live in,
When for earth too fancy-loose,
And too low for heaven.
I sleep, and talk my dream aloud,
I build it fair to see—
I build it on the moonlit cloud,
To which I looked with *thee*.

Cloud-walls of the morning's grey
Faced with amber column,
Crowned with crimson cupola
From a sunset solemn—
For casements, from the valley fetch
May-mists glimmering,—
With a sunbeam hid in each,
And a smell of spring.

Build the entrance high and proud,
Darkening and eke brightening,
Of a riven thunder-cloud
Veinëd with the lightning.
Use one with an iris-stain
For the door within,
Turning to a sound like rain
As we enter in.

For the fair hall reached thereby
Walled with cloudy whiteness,
Take the blue place in the sky,
Wind-worked into brightness—
Whence corridores and long degrees
Of cloud-stairs wind away—
Till children wish upon their knees,
They walkëd where they pray.

Be my chamber tapestried
With the showers of summer,
Close and silent, glorified
When the sunbeams come there—
Sudden harpers, harping on
Every drop as such,—
Drawing colours like a tune,
Measured to the touch.

Bring a shadow green and still
From the chesnut forest—
Bring a purple from the hill
When the heat is sorest,—
Spread them out from wall to wall,
Carpet-wove around;
And thereupon the foot shall fall
In light instead of sound.

Bring a grey cloud from the east
Where the lark was singing—
Something of the song at least
Lost not in the bringing,—
And that shall be a morning chair
For poet-dreams,—when with them
No verse constraint—the floating air
Their only, lovely rhythm.

Bring the red cloud from the sun—
While he sinketh, catch it,—
Bring it for a couch, with one
Side-long star to watch it—
Fit for a poet's finest thought,
At curfew time, to lean;
When things invisible are brought
More near him than the seen.

Poet's thought, not poet's sigh!—
Alas! they come together!
Cloudy walls divide and fly
As if in April weather.
Hall, corridore, and column proud—
My chamber fair to see—
All pass—except that moonlit cloud
To which I looked with *thee*.

Let them!—Wipe such visionings
From the fancy's cartel;
Love secures some frailest things,
Dowered with his immortal.
Suns, moons may darken—heaven be bowed,—
But here unchanged shall be,
Here in my soul—that moonlit cloud,
To which I looked with *thee*.

OUR WEEKLY GOSSIP.

On the very interesting subject which has of late occupied so much of public attention, both in Europe and America, the periodical return of the meteors in August and November, we have been favoured with the following communication from Sir John Herschel.

To the Editor of the *Athenæum*.—Sir, the bright moonlight of the 9th inst. having prevented my obtaining satisfactory observations of the meteors, to whose periodical return on the 9th and 10th of this month Prof. Quetelet has drawn much attention, as being more regular than the displays of the 12th and 13th November, allow me, in place of observations for the current year, to offer, as my contribution to our stock of knowledge of the subject, the following incidental mention of such an occurrence, which occurs in Sir W. Hamilton's account of the great eruption of Vesuvius in August 1779, printed in the Transactions of the Royal Society, Vol. 70, which will be read with the more interest, the periodical nature of the phenomena being then unknown, and its occurrence being ascribed by him to some local electrical agency developed by the volcanic ejections. "August 9, 1799," after describing the phenomena of the eruption during the day till seven o'clock at night, "when all was calm," Sir W. Hamilton goes on to say, "It was universally remarked, that the air this night, for many hours after the eruption, was filled with meteors, such as are vulgarly called falling stars. They shot generally in a horizontal direction, leaving a luminous train behind them, but which quickly disappeared. The night was remarkably fine, starlight, and without a cloud. *This kind of electrical fire seemed to be harmless and never to reach the ground*, whereas that with which the black volcanic cloud of last night was pregnant, appeared mischievous, like that which attends a severe thunderstorm." The meteors of August 9, 1840, in so far as I observed them, radiated almost without exception from a point in the heavens very near the star γ (Gamma), in the constellation Perseus; which is almost coincident with the point (near the star B Camelopardali) from which I observed them to emanate on the 10th August 1839. Facts of this nature appear almost decisive in favour of the opinion, that a zone or zones of these bodies revolve [illegible] and are intersected by the earth in its annual [illegible]. I have the honour, &c.

J. F. W. Herschel.

[illegible], Aug. 15, 1841.

The result of the expenditure of 3,650*l.* by the prize-holders in the Art-Union, was thrown open to the subscribers on Saturday, in the shape of an Exhibition. The holder of the first prize of 300*l.* has indulged his taste and liberality by purchasing, with an additional 200*l.*, Mr. M'Clise's 'Sleeping Beauty.' The second prize, of 200*l.*, has been claimed for Mr. Haghe's clever water-colour drawing, 'The Oath of Vargas;' and the third, of 100*l.*, for an 'Arcadian Nymph,' by Mr. E. Latilla. We will not proceed further in our enumeration: to do so would necessarily lead us into strictures on the taste of certain among the fortunate subscribers, which might be thought ungracious. We have been frequently requested by correspondents to call public attention to the progress of this Society, so specious in its appearance of patronage and encouragement of art and artists, but we have in reply hinted our objections, and we felt, while in the Exhibition Room on Saturday, that there was more than a sufficient justification for our silence. In brief, we are afraid that the more money raised by *such* societies, the more injurious will be their influence on Art. To buy a picture presupposes, at least, a love for, and this may in time lead to a knowledge of art; but people subscribe to these Art-Unions as they put down their money when a raffle is proposed for a horse or a pipe of port wine—and the vast majority of the subscribing members would prefer the horse or the wine to all the pictures that were ever painted. It is not a love of art, but of a little innocent gambling, that tempts the money out of their pockets. Were the pictures selected by a Committee, as in the Edinburgh Association, and most of those on the continent, it would tend to raise the standard of public judgment, for it is fair to assume that a Committee, selected from among the subscribers, would be better informed than the members generally; but when every individual member, be he whom he may, is allowed to follow his own judgment in the disposal of his prize-money, the best results can be but an irresponsible indulgence of individual whim and caprice,—the worst, and certain, is the degradation of art. Men who paint to live, instead of working with all their power, be it more or less, up to the best and highest judgments, must now descend to the lowest, and, instead of seeking for the approbation of the intelligent, must solicit the sweet voices of the uninformed, the chance prize-holders, and therefore purchasers, of the Art-Unions. These objections are inherent in the very constitution of the Society, but there are others hardly less obvious. As we stated when the scheme was first announced, it is open to gross and manifest abuse—and, if report be true, this is no longer a mere speculative possibility.

So attractive—and no wonder!—prove Mr. Burford's panoramic exhibitions of foreign scenes and cities, that he has been led to add a third and smal*lest* circle to his establishment in Leicester Square—within the compass of which, by way of opening, a cabinet picture of *Jerusalem* is exhibited. We speak thus advisedly, for, in spite of the very great drawbacks of restricted space, which brings the spectator within a few feet of the canvas, the high finish, delicate detail, and forcible effect of this panorama exceed those in any larger one we can call to mind. On the interest of the subject it is needless to dwell, at a time when so many eyes are turned upon the Holy Land, and the Holy City, in veneration of their past, or curiosity as to their future destinies.

The scientific world will sympathise with Mr. Gould, the naturalist, in the heavy affliction with which he has been visited, by the loss of his wife, a woman of exemplary worth in all the social relations, and whose talents as an artist have been conspicuous in the various ornithological works of her husband,

which were principally illustrated by her hand. Mrs. Gould died on the 15th inst., only a few days after giving birth to a daughter, the sixth surviving child. She was in her 37th year; and up to a short time previous to her accouchement had enjoyed good health, and having as usual been actively employed in drawing, which divided her time and attention with domestic duties.

A Correspondent directs our attention to a new and curious invention in the art of Typography, which has been completed by Mr. Nies, a publisher at Leipzig, and which promises to be of great service to an important branch of literature. We allude to the reproduction of Egyptian inscriptions by means of moveable types. It is obvious that this will reduce the enormous expense attending the publication of works on the palæography of Egypt, an expense which has rendered them so costly as to be inaccessible to a vast majority of the literary world. The Trustees of the British Museum are now publishing fac-similes of the papyri in our national collection by means of lithography, and the inscriptions in the Museum at Leyden are being given to the world in the same dress. May we not hope that new and cheaper editions will be issued by means of Mr. Nies's invention? Our informant tells us, that Mr. Nies has already cast more than 3,000 types, and is continually adding to the number as new characters are discovered; that the types are well designed, and the impression sharp and clear. He adds, that Mr. Nies has also cast founts of types of the Hieratic and the Enchorial or Demotic hieroglyphs, as well as of other characters which, till now, have not been represented by typography; and he directs the attention of orientalists to his specimens of Phœnician, Palmyrene, Samaritan, Aramæan, Cufic, Zend, Pehlevi, Babylonian, and Persian cuneiform, and Mandshu characters, which are, he says, beautifully and accurately excuted.

The first appearance of Miss Clara Novello on the Italian stage, has taken place at Padua, it is said with perfect success, the part chosen being 'Semiramide.' The first appearance of Miss Adelaide Kemble on her own stage, will, we believe, be made at Covent Garden, late in the year, in the part of '*Norma*.' While talking of *débuts*, we may add that the cooper of Rouen, who has for some time been at odds with the management of l'Académie Royale, will shortly make his bow to the Parisian public in 'Guillaume Tell.'

We are indebted to a friend for the following extract from the private letter of an intelligent traveller, dated Nishni Novgorod, July 8th:—

The information which I have picked up about the eastern shores of the Caspian is most discouraging. I take the country to be quite impracticable at the present moment. The feelings of the people are so exasperated against the Russians, that it would be most hazardous to attempt it from this quarter. Neither do I think that *our* operations to the south are likely to have gained the affections of the Turkomans. However, I doubt not in our progress I shall gather much intelligence that may be useful to some future traveller, or to myself at some other time. For the last two years neither Bokharans nor Khivans have made their appearance at the fair, being in the dumps at certain treatment the latter met with not long since. That will blow over before long of course, and then either this point or Astrakan will be the goal to start from. We had intended passing the Caucasus to Teflis, and so to Bagdad, and thence by Palmyra to Constantinople; but I am sorry to say we have been here again signally defeated. Count Stroganoff refused to give us passports into Circassia, asserting that such a proceeding would be contrary to the Emperor's strict injunctions. If this, however, were the only difficulty in the way, I believe his Imperial Majesty might be easily circumvented, and we could get through. But there is another insurmountable obstacle: the plague is ravaging Teflis, and it would not be wise to run a risk of that kind, to gratify even a laudable curiosity. We shall, therefore, go down to Kasan, and from thence to Astrakan, after which we purpose to cross the steppes of Astrakan and the district of the Calmuc Tartars, bordering upon the Caucasus, to Taganrock, and then to see the Crimea, and pass on to Constantinople. We have been for some time to-day bartering with a crew of Tartars to take us by water to Kasan, but upon visiting their boat it proved much too heavy. Since that we have made a similar attempt with a crew from Kasan; but the wind being contrary, and our terms not agreeing, we have determined to go forward in our carriage to Kasan, where we must of necessity get upon the river. From hence to Kasan there is no road, but the distance is not more than 380 versts. The crews of the boats remind me much of Mansoor and Co., with whom we made acquaintance at Cairo. ** The heat is most melting. I had no idea it could be so intense in this latitude; but I speak more particularly of Moscow.

At a meeting of the Royal Society of Northern Antiquaries, held at Copenhagen on the 19th July, the third volume of 'Historical Narratives of Icelandic Voyages,' containing the adventures of Nial and his sons, was laid before the meeting as ready for the press. Prof. Rafn exhibited some specimens of maple, transmitted by Dr. Webb, of Rhode Island, with reference to the Mösur wood, mentioned in the Saga of Erik the Red. These were varieties of the *Acer saccharinum*, and it was the general opinion that they are the description of wood which the ancient Northmen called Mösur, and a piece of which was brought by Thorfinn Karlsefne from Vinland in 1014. Some ancient Indian articles of stone, brought from Ohio, were also exhibited; they are said to bear a marked resemblance to Northern remains, and were shown by Prof. Thomsen to have served formerly as a medium of value and exchange.

Close of the present Exhibition.

BRITISH INSTITUTION, PALL MALL.

The Gallery, with a Collection of Pictures from the Italian, Flemish, and Dutch Schools; also the works of the deceased English Artists, Sir J. Reynolds, Wilson, Gainsborough, Hogarth, and a Selection from the pencil of the late Thomas Stothard, Esq. R.A., IS OPEN DAILY, from Ten in the Morning till Six in the Evening, and will be closed on Saturday, the 28th inst.—Admission, 1s.; Catalogue, 1s.

WILLIAM BARNARD, Keeper.

THE DIORAMA, REGENT'S PARK.

The TWO NEW PICTURES now exhibiting, represent the Interior of the CATHEDRAL OF AUCH, in the South of France, and the SHRINE OF THE NATIVITY, at Bethlehem, taken from a sketch made on the spot by D. Roberts, R.A., in 1839, with various effects of light and shade. Both Pictures are painted by M. Renoux. Open from Ten till Five.

ROYAL POLYTECHNIC INSTITUTION, REGENT STREET.—NEW LECTURES on the DAGUERREOTYPE and PHOTOGRAPHIC PORTRAITS, with Illustrations, and a full Explanation of the Chemical Process adopted. On BAIN'S ELECTRO-MAGNETIC PRINTING TELEGRAPH. On BARWISE and BAIN'S PATENTED ELECTRIC CLOCKS, in action. Also other interesting Lectures and Experiments. CARY'S ORRERY and the NEW DISSOLVING VIEWS. Nearly 2,000 Works which display eminent Art, Science, and Ingenuity. Microscope. Diver. Diving Bell. CANTON, and other beautiful COSMORAMIC VIEWS, are added to the Evening Exhibition.—Admission, 1s.

MUSIC AND THE DRAMA

Her Majesty's Theatre.—Besides recording the close of the Opera subscription-nights on Tuesday with 'Norma,' and 'Le Diable Amoureux,' we are also now to record, if report is to be credited, the last evening of Rubini; who takes his benefit, and his farewell of England, to-night, in some of his favourite *scenas*.—In the irrevocable nature of these theatrical *adieux* our confidence is not over-profound. Remove the actor from the stage, and what remains to him?—only listless hours, made all the more intolerable by the decay of physical elasticity—only ever-recurring yearnings for that applause, which, say what men will in their philosophical moments, must be a reward more precious than gain,—or who would endure the continued wear and tear of intercourse with a capricious public? What, then, so solacing as the flattery which entreats the retired veteran to return? what so hard to withstand as the last dregs of the cup of intoxication? Rossini is almost the solitary instance of a public favourite retiring before his time, which the annals of Music, at least, furnish. Hence, it will be no surprise to us, if Rubini, like so many of his predecessors, says

"good night until tomorrow,"

or, in other words, is still heard far oftener than his enthusiastic admirers are now willing to hope. Among this company we have never been numbered. For truth's sake, we are bound to say, that Rubini's influence upon the art of dramatic singing has been eminently pernicious, that his example has been calculated to lead away artists and audiences—and consequently composers—from a noble and appropriate conception of a whole part, to the exquisite and minute finish of a single *cavatina*.—Still, while we consider the intellectual portion of his art to have been rarely if ever touched—assuredly never considered—by him; Rubini must long be honoured as the most accomplished vocalist of his time. It was, perhaps, the very perfection to which he had brought the delivery of his voice, the finish of his slightest ornaments, and the sport with difficulties utterly beyond the reach of most singers, which tempted him to enervate his style. And though the younger generation of tenors who aspire to succeed him will do well to cast out of account the general carelessness and hurried monotony of his recitatives, his determination to produce an effect by perpetual displays of the curiosities of vocalism, no matter how inappropriate to time and situation—they may with profit as well as safety look back to his method of execution as something rare, perfect, and worthy of all imitation.

The Haymarket alone furnishes any topics for remarks this week, and those of slight and transient interest. The American comedian, Mr. Placide, did not belie his name by his performance of *Sir Peter Teazle* on Friday last, which was of a quiet, even tenor, that excited neither fears of failure nor hopes of success: it would have been one of the wonders which genius only can achieve, had the citizen of a young republic, and the actor of a stage new in a national point of view, been able to personate the denizen of a highly artificial state of society, and assume the polished graces and courtly airs that give dignity to the very infirmities of the character. Mr. Placide, however, is an artist of respectable talent, and free from the besetting sin of coarseness, which is so prevalent among modern comedians,—and this alone is a great recommendation; but the dryness and harshness of his physiognomy, voice, and manner preclude any expectation of his success in the highest walk of genteel comedy, for which general humour and refinement are essential requisites. The transatlantic stranger must have been gratified by his reception, which was the warmer from the favourable impression of his personal appearance and proper costume: allowing, however, for the restraint incidental to a first appearance, we cannot but consider Mr. Placide a useful acquisition to the thin ranks of our comedians, if a humbler position satisfy his aspirings. As the 'School for Scandal' was played for the nonce, we will only remark that the return to the old medley of fashions in the dresses was more disappointing after the brilliant completeness of costume which distinguished the performance at Covent Garden, and even at this theatre; the same reason induces a lenient oblivion of the demerits of the rest of the performers. We missed seeing 'William Tell,' which was performed on Monday, and is to be repeated weekly on that day, as 'Virginius' is on Thursdays; but Macready's personation of the Swiss patriot is so well remembered that eulogy and criticism are alike superfluous in the way of information.

The English Opera House has been engaged by an association of literary aspirants to dramatic fame, as a rallying point for neglected genius, and a stage for the representation of unacted dramas; and with a view to redress the grievances of dramatists and to break up the monopoly of the patent theatres. The "Dramatic Authors' Theatre," as it is styled, is managed by a "council," who, in the bills announcing their first performance to take place on Thursday, appeal to the public for support, and claim indulgence for the "irregular form" in which they are compelled by law to present "a high tragic composition." The tragic burletta alluded to, is a version, by Mr. George Stephens, of his "magnificent dramatic poem" 'The Hungarian Daughter,' under the title of 'Martinuzzi,' which is to be produced with songs and music, "according to Act of Parliament." The bill is garnished with laudatory extracts from newspapers and periodicals, which will rise up in judgment against any unfavourable opinions from the same quarters, as to the merits of the drama in its new shape. The tragedians are Messrs. Elton, Phelps, and Selby, Mesdames Warner, Maywood, and Fortescue; the vocalists Miss Collett and Mr. Morley; and the talents of the performers are such as to excite no apprehensions of failure in so far as the acting is concerned; the play is to be followed by a farce entitled 'The Cloak and Bonnet,' from the pen of Captain Marryat. The novelty of the experiment will doubtless attract a good audience, and we cordially wish it success. Though we are not very sanguine as to the efficacy of the scheme in regenerating the English drama, or elevating the character of the stage: still, as advocates of free trade, in theatrical business as well as in commerce, we shall be glad if it leads to the placing of the theatres on a fairer and more equal footing, by doing away with exclusive privileges, alike injurious to all parties concerned.

ELEVENTH MEETING OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

[*From our own Correspondents.*]

MONDAY, AUGUST 2.

SECTION A.—MATHEMATICAL AND PHYSICAL SCIENCE.

Prof. WHEWELL gave an Abstract of a 'Report on the present state of our Theoretical and Experimental Knowledge of the Laws of Conduction of Heat,' by Prof. Kelland.

The object of the Report was to lay before the Association an outline of the present state of our theoretical knowledge of the laws of transmission of heat by conduction, and to examine how far conclusions deduced from theory have been tested by experiment. There was no reference therefore to theoretical investigations, however important in themselves, which were not capable of being examined by direct experiment; and the names of many illustrious experimenters on conduction and radiation were passed over, when their experiments were not calculated to serve as the immediate test of theory.

To render what has to be said as clear as possible (said the Professor) the subject matter has been arranged under three heads—two of these are distinctly marked out by the statement of the object proposed to be effected, and the third is suggested by the consideration of the former two. We shall examine, then, 1st. What is the present state of our theoretical knowledge of the phenomena of conduction; 2nd. Into the state of experimental investigation, so far as it has been undertaken with a view to test, or to illustrate, the conclusions arrived at by theory. This critical discussion of the hypothesis will lead us to point out—3rd. the inadequacy of the few experimental facts with which we are furnished to serve either as the basis of a true theory, or as the indication of a false one. * * It will only remain for us to point out in conclusion what are the most important results of theory which it is desirable that experiment should be brought in to test, and to suggest a few of the most simple means of effecting the object desired. 1st. The problem, in the solution of which consists the mathematical theory of heat, is the following:—Having given the state of heating, or the variation of that state from time to time, at one or more points of a homogeneous body of given form and dimensions, to find the permanent or variable temperature at every other point. Thus a ring is kept at a certain temperature at one point, and it is proposed to discover, first, what is the variation from time to time of the temperature at every other point. 2ndly. what is the ultimate temperature to which that at any given point approaches, as the time during which the constant heating of one point has been kept up, is increased. From this statement it will appear that the experimental facts on which the theory must rest, are the answers to the following questions. 1. According to what law does a heated body lose its temperature to the air, or other medium or space, by which it is surrounded? 2. According to what law is the temperature transmitted from point to point of a body? On the correctness of the answers which may be assumed as given to these questions, depends the applicability of the results obtained to the state of things in nature.

The Report then proceeded to show what answers have been given to the above questions by different theorists, and to explain the evidence on which their truth was supposed to be established. In conclusion, it was observed,

We find that there are three distinct ways of theorizing, each adopted, apparently, in accordance with the known laws of nature, but which differ essentially from each other. We do not perceive that our existing experiments bear with greater weight in establishing or disproving any one of them than it does in establishing or disproving the other two. Each is confirmed by one experiment, each at variance with another. Are we to account for this circumstance from the difficulty of conducting the requisite experiments? or are we not rather to attribute the anomaly to the little regard which has of late years been paid to a certain class of subjects, and in especial to the one before us? We are not aware that it has suggested itself to any one experimental philosopher to examine into the laws of conduction. Much labour, it is true, has been bestowed in examining the conductive powers of different substances; and to the results of experiments carried on with this object, we look naturally with the hope of extracting a law. But, unfortunately, the nature of the experiments we are presented with is not such as will lead to what we seek. They are not originally conducted with reference to the state of things assumed to exist in theory, and are, in consequence, of less value, when allowance is made for the difference between what they express and what theory requires. Now we do not deny that difficulties do attend the experimental examination of this subject when it is intended to make everything correspond with the state supposed in theory. The chief and greatest of these, we conceive to arise from the presence of the air. MM. Dulong and Petit have shown that the quantity of heat carried off by the air is not only very large, but is governed by a law very different from that of ordinary radiation. Means have therefore to be devised for removing this cause of error; but we are far from thinking that the difficulty of effecting this amounts to an impossibility. If MM. Dulong and Petit could succeed in determining the rates of cooling of a body in vacuo, we cannot see why others should not succeed in showing the stationary temperature, at one point at least, of a body which radiates in vacuo. This leads us to the suggestions with which we shall conclude the present Report. We shall offer two—1st. as to the most important experiments. 2nd. as to the mode by which they may be conducted. It is, perhaps, chargeable against the theoretical writers on this branch of Physics, and especially against M. Poisson, that they have not presented their results in a form sufficiently tangible to direct or suggest the application of experiment to them. It is much to be regretted that no attempt has been made to obviate this. With the view of remedying the state of things to a certain extent, we have exhibited, in their most simple forms, some of the more obvious conclusions to which the different theories lead. No doubt much might be done in this way, but until called for by the entry of experimenters on the field, a large and varied collection of formulæ would serve no useful purpose. One class of experiments alone appears amply to suffice for our present purpose. The object being to discover a law of conduction, it will be best attained by the selection of circumstances in which radiation either plays no part at all, or in which its effect is very simple and readily eliminated. By selecting a substance of small conducting power such as marble, and cooling the block with a substance which will radiate very slowly, this experiment may be made on a block of no very great dimensions. For many reasons this experiment is well worth trying. * * We would point out another important experiment—the determination of the state of temperature at one extremity of a bar which is heated at the other. This experiment should be made on a variety of bars of different conducting powers, and of different lengths. With a set of careful experiments of this nature, we believe, we could pronounce without fear the true law of conduction. Nor do we think the difficulties attendant on the conduct of the experiments to be at all insuperable. * * The real practical obstacle is the presence of the air. We have seen that the law of cooling into air is different from that of radiation—even supposing, therefore, that we were in possession of the correct statement of that law, such would be the difficulty of obtaining formulæ from it, that to attempt to eliminate its effect, together with that of radiation, is almost hopeless. If it can be done at all, it must be by means of experiments carried on in air of different elasticities. It has been proved by MM. Dulong and Petit, that the velocity of cooling of a body due to the sole contact in a gas, depends, for the same excess of temperature, on the density and temperature of the gas; but this dependence is such, that the velocity of cooling remains the same if the density and the temperature of the gas change in such a way that the elasticity remains constant. The effect, then, of the presence of the air is to introduce a term which involves a power of the elasticity as one factor, and a function of the excess of temperature as another. The latter function may be determined (perhaps) by means of a number of experiments made at different elasticities, but we should greatly prefer a set of experiments on radiation in vacuo. It appears to us that the difficulty in this case is very much the same as that against which MM. Dulong and Petit had to contend in investigating the kindred law of radiation, and we should conceive that a similar contrivance to that which they used might be adopted to overcome it. All that we require is, that a certain portion of a bar heated at one extremity radiate in vacuo, and that the temperature at two of its points, the other extremity being one, be capable of constant observation. MM. Dulong and Petit made use of a copper balloon which could be exhausted of air, and by means of ice be kept constantly to the freezing temperature, notwithstanding the radiation of the heat from the body within it. A somewhat similar contrivance, we conceive, would serve for the conduct of the experiment before us. The bar of metal to be experimented on might pass through the balloon, and be heated in air, whilst the assumed point of heating might be marked by a thermometer inserted into a hole in the bar just within the balloon. We wish M. Biot had marked his lowest point not at the surface of the heated mercury, but at a point a little above it: it would have ensured a greater steadiness in the results. Should any one think of undertaking this experiment, we would recommend that he extend his observations over a wider range of temperature than M. Biot has done. The thermometer which represents the heated end of the bar should stand permanently at every 5°, from 0° to as high as can be accomplished. The observations should likewise embrace a succession of bars of different substances—iron, brass, lead, &c. all of the same dimensions. Different series of observations should be made, in which the dimensions of the bars have different constant magnitudes, and others in which they have different lengths. All the substances might be coated with the same varnish, so as to render their radiating powers the same. With such experiments we have no doubt that the law of conduction, though not, like the law of radiation, an inference from direct experiment, might be readily established, and the science of heat placed on the same footing with the other mathematical sciences.

Prof. WHEWELL directed attention to the importance of these inquiries, and to the difficulties, mathematical and experimental, which opposed progress in the science of heat, and the importance of having the attention of both classes of inquirers thus directed to the precise difficulties, with a view to their removal.

Mr. DE MOLEYNS read a communication on a new Voltaic Combination, which he said was of extraordinary power.

Dr. ROBINSON inquired what the fluid was which Mr. De Moleyns used.—Mr. De Moleyns replied, that as the arrangement was the subject of a proposed patent, he did not at present wish to make known the fluid used.—Dr. Robinson replied, that in that case the communication was so imperfect that it was doubtful to him whether it should have been offered to the Section.

'On the Temperature of the Air in York Minster,' by Prof. Phillips.

It may be remarked, that the vastness and loftiness of the interior of York Minster renders the air within it, in a great degree, free from violent local draughts, and yet subject to a continual gentle circulation. At the time when the observations now to be noticed were made, there was no heating apparatus in the church: the lights used were a few scattered tapers. The observations were made in the interval from April 8, 1808, to July 31, 1811. There is an interruption from 27 April to 21 May, 1810, owing to the absence of the observer, and a few single days are left without observation. From 8 April 1808 to 12 July 1808 (inclusive), the hour of observation is not given. Afterwards it is given for each day, the hours varying from 11 to 5; the far greater number are taken at about 1, and a sufficient proportion about 2 and 3, to render the mean of the whole about 2 P.M. or nearly the epoch of maximum daily temperature in the open air. The observations are registered to ¼ and ¼ degrees, and, as far as can be judged from inspection, appear to be very faithfully recorded. The following are the deductions:—1. The comparative mean annual temperature within and without York Minster. 2. The comparative mean monthly temperature of the interior of York Minster, and the mean monthly, and mean maximum monthly temperature of the surrounding atmosphere. 3. The comparative epochs of mean annual temperature for the same conditions.

TABLE I.

Mean temperature of the air without the church,	for 40 months, deducting the four last	49.2433
	for ditto ..... deducting the four first	49.1316
	Mean	49.1874
Mean temperature of the air within the church,	for the same 40 months, deducting the four last	49.5833
	for ditto ..... deducting the four first	49.7711
	Mean	49.6772
Air within the Minster warmer than without		0.4898
General mean temperature of York for 25 years ..		43.2000

TABLE II.

	Mean temp. within.	Mean temp. without, in same months.	Approximate mean max. temp. without.
January ..	36.68	33.39	44.7
February ..	39.03	39.01	46.25
March	43.14	42.91	49.3
April	45.74	48.20	55.9
May	53.77	57.01	64.0
June	58.22	61.18	72.3
July	61.22	62.42	73.0
August	62.52	63.51	73.4
September	59.82	57.26	66.1
October ..	52.18	47.31	58.2
November	44.40	40.81	51.3
December	40.52	36.43	46.4

It appears that from nearly the end of March to nearly the end of August, the air within the Minster is colder than the mean temperature of the air without; and from nearly the end of August to nearly the end of March it is warmer. The excess of warmth rather exceeds the deficiency, and the epochs of mean annual temperature are retarded, probably about 12 days, within the Minster,—a result which may be compared with some of the conclusions arrived at in the prosecution of experiments on subterraneous temperature, at small depths.

The PRESIDENT drew the attention of the Section to the close analogy of these observations to those of Prof. Forbes on subterranean temperature.—M. A. QUETELET, of Brussels, agreed with the President as to the interest which attached to these observations in their relation to the observations on subterranean temperature, and took this opportunity of expressing the interest taken on the Continent in Prof. Forbes's researches.—Dr. ROBINSON inquired whether the number of days during the progress of the observations upon which the doors of the building had been opened had been registered, as also the number of hours, the size of the doors, the free communication of the internal air with the external, through openings in the roof, the average number of persons who usually assembled in the Minster, either as visitors or at public worship, or any other circumstances which might affect the temperature of the air within. If this had not been done as yet, he suggested the importance of registering them in connexion with

the observations. He felt, he said, a peculiar interest in these observations, inasmuch as he considered that, by a very slight modification, they might be made subservient to the purpose of determining the rapidity or slowness with which the several strata of air as you ascend, alter their temperatures as the conditions upon which their equilibrium depended was varied. The intimate connexion between this and atmospheric refractions would be readily perceived, but it would be out of place for him to point out more minutely that connexion. Suffice it to say, it was a subject upon which he had been anxiously engaged during many years, and any collateral information which could be brought to bear on it would be highly prized by him. He had been aware of the general effect of massive buildings on the internal temperature in a general way for some years. He kept a meteorological register in the Observatory at Armagh, the indications of the thermometer, barometer, and hygrometer, being taken at 9 A.M. and at 10 P.M. And here, though not quite in place, he could not help remarking, that he did not find the hygrometric state of the air to influence the refractions beyond a very low altitude indeed. The mean temperature of the external air at the Observatory, he found to be about 47°.8, as well as his memory served him, while the mean temperature of the air within the Observatory he had found to be about three-fourths of a degree higher, although, from the necessity of the case, the several covers in the roof were almost constantly thrown back, thus establishing a very free communication with the external air; this fact, however, might in part depend upon the temperature of the persons of the observers, and the heat of the lamps used for the purpose of illumination. He would strongly urge upon Prof. Phillips the continuation and extension of these observations, as few places afforded circumstances equally favourable.—Prof. Phillips wished to state that he was sorry this had not occurred to him long since, as he feared the state of the Minster was now very much changed, as instead of the small twinkling tapers with which it had been formerly lighted, it was now brilliantly illuminated with gas, and stoves had also been put up for warming it preparatory to assembling for divine service on Sundays.—Prof. Christie conceived that these very changes were more favourable towards attaining the information which Dr. Robinson desired.—Dr. Robinson concurred in Mr. Christie's observation: the massive structure of the building cut off communication, to a considerable extent, with the external air, and, as it were, circulated that within; while these very sources of change, by causing a more rapid recurrence of the phenomena, would, no doubt, more speedily, as well as more decidedly, put us in possession of what we wished to know, namely, the rapidity and manner in which the several strata of air interchange or transmit influences from below upwards, or *vice versâ*.

'Report on the State of the Inquiry into the action of Gaseous and other Media on the Solar Spectrum.'

In prosecuting this inquiry, my attention has been principally directed to the action of the earth's atmosphere upon the solar spectrum, and I hope to be able to present to the next meeting of the Association a map of the bands produced by atmospheric absorption. I have also made considerable progress in constructing a map of the spectrum containing the numerous lines and bands produced by the action of nitrous gas. In submitting to examination several other gaseous media, my results have been principally of a negative character: but, in my experiments with solid and fluid media, I have been led to many positive and interesting results. In order to obtain additional accuracy of observation, particularly near the extremities of the spectrum, Mr. Dollond has constructed for me some important pieces of apparatus, for directing and condensing the solar rays; and I have recently obtained from Mr. Herz, of Munich, a very large prism, to be used with the telescope, and a series of smaller prisms for constructing a prismatic cylinder for the purpose of expanding or magnifying particular parts of the spectrum. D. Brewster.

Dr. Robinson took the chair, and the President, Prof. Lloyd, then communicated 'The Results of some Investigations on the Phenomena of Thin Plates in Polarized Light.'

He stated that his attention had been drawn to this subject by a letter which he had recently received from Sir David Brewster, describing a large class of hitherto unobserved phenomena. Sir D. Brewster having expressed his desire, in this letter, to know whether the wave theory could furnish an explanation of the facts which he had observed, Prof. Lloyd was then led to undertake the investigation which formed the subject of the present communication. Mr. Airy had long since inferred, from a consideration of the form of Fresnel's expression for the intensity of reflected light, that when light polarized perpendicularly to the plane of incidence was incident upon a thin plate bounded by media of unequal refractive powers, a remarkable change in the reflected light should take place, when the angle of incidence was intermediate to the polarizing angles of the two surfaces of the plate. This theoretical anticipation was fully verified by experiment. When a lens of low refracting power was laid upon a plate of high refracting power, the rings which were formed appeared with a *black centre*, when the angle of incidence was less than the polarizing angle of the low refracting substance, or greater than the polarizing angle of the high refracting substance; while, when the incidence was intermediate to these two angles, the rings were *white centered*, and the whole system was *complementary* to what it had been before. At the polarizing angle itself, the rings disappeared, there being no light reflected from one of the surfaces of the plate; and therefore no interference. The examination of this subject has recently been resumed by Sir D. Brewster; and he has repeated the experiments of Mr. Airy in a more general form, the incidental light being *polarized in any plane*. He has thus been led to many new results. The rings are found to *disappear* under circumstances in which light is reflected from *both* surfaces of the plate; and there are many remarkable peculiarities in the transition of the rings into the complementary system. It was to the theoretical explanation of these phenomena that Prof. Lloyd now invited the attention of the Section. In the conduct of the investigation he has generalized the methods followed by M. Poisson and Mr. Airy on the same subject. The incident vibration being resolved into two, one in the plane of incidence, and the other in the perpendicular plane, each portion will give rise to an infinite series of reflected vibrations, into which it is subdivided at the bounding surfaces of the plate. The expression of the resultant intensity for each portion being then deduced, the actual intensity of the reflected beam is the sum of these intensities; and it is found that the *part dependent on the phase will vanish*, and therefore the rings disappear, when the plane of polarization is connected with the incidence by the following formula,

$$\mathrm{Tan}^2\,\gamma = -\frac{\mathrm{Cos}\,(\theta-\theta')\,\mathrm{Cos}\,(\theta'-\theta'')}{\mathrm{Cos}\,(\theta+\theta')\,\mathrm{Cos}\,(\theta'+\theta'')}$$

in which θ is the angle of incidence on the first surface; θ', the angle of refraction at first surface, or the angle of incidence on second, and θ'' the angle of refraction at second surface. It follows at once, from this expression, that the disappearance of the rings is only possible when $\mathrm{Cos}\,(\theta+\theta')$ and $\mathrm{Cos}\,(\theta'+\theta'')$ are of opposite signs, i. e. when the angles of incidence on the two surfaces are in the one case greater, and in the other less, than the polarizing angle. It further appears, from the investigation, that the two portions of which the reflected light consists, and which are polarized respectively in the plane of incidence and in the perpendicular plane, *differ*, in general, *in phase*; and that, consequently, the resulting light will be, in general, *elliptically polarized*. The author entered into some developements on this part of the subject, which (as far as he was aware) had not been noticed by Sir D. Brewster in the course of his experimental inquiries; and he stated some important bearings which he concluded it might possibly have upon the phenomena of elliptical polarization by metals.

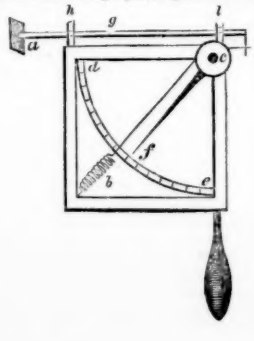
Prof. Sylvester inquired, whether Mr. Lloyd had made any experiments in confirmation of these results.—Prof. Lloyd replied, that he wholly relied upon the experiments of Sir D. Brewster, so far as they had gone; but that as Sir D. Brewster's paper was not yet published, he had had no opportunity as yet of making a numerical comparison between the results of experiment and theory.

Mr. W. S. Harris made a communication 'Upon the working of Whewell's Anemometer at Plymouth during the past year.' He exhibited the curves for the year on a diagram 12 feet high by 7 feet wide, a red tape line showing the total effect.

My last Report on this instrument contained an account of certain improvements in the mechanism and mode of fixing, found by experience, necessary to its perfect employment. I have now the honour of bringing under the notice of the Physical Section, a series of observations, continued for a whole year; from which has been laid down, by the inventor's method, a graphic delineation or type of the wind during this time, and extending from July 1840 to July 1841. It will be seen by this chart now before us, that we have, to a great extent, realized Mr. Whewell's happy thought, namely, that of obtaining a sort of type of the winds for a given place, so as eventually to arrive at the general annual movements of the air. The mean result of the observations now before us agrees nearly with that arrived at by the observations made by Mr. Southwood, with the same instrument, and printed in the Eighth Report of the Association. It shows in this place (Plymouth) an annual movement of the air from the S.S.E. toward the N.N.W. nearly. It is not a little interesting to observe the daily march of the wind, as indicated by daily register of the instrument. We find, for example, certain tourbillons or great disturbances occurring here and there, which seem to interfere with what might probably, in more settled latitudes, be a constant and regular movement of the air, as in the trade winds; yet, upon the whole, the progress of such a regular current is traceable, notwithstanding these interferences; and the movement of the air is found to be always from the southerly to the northerly points of the compass. It does not seem requisite, for our present purpose, to attempt more than a very summary generalization; without therefore obtaining, by a strictly geometrical method, the resultant magnitude and direction for each month, and from these again the resultant magnitude and direction of the whole, as done in my former Report, it will perhaps suffice to pass a line immediately through the whole series of types, in such way as to obtain by the eye alone the final resultant. Such a line will evidently pass from the S.S.E. to the N.N.W. points of the compass, or very nearly. If now we associate this fact with the results obtained from the hourly meteorological observations at the Dockyard, we are entitled to say, so far as our experiments extend, that there is an annual movement of the atmosphere in this latitude toward the north, under a mean pressure of 29.900 inches nearly, taken at the level of the sea, and a mean temperature of 52° Fah. The complete and satisfactory working of the anemometer, now that it has undergone certain amendments, found by experience desirable, leads me to hope that its use will be persevered in, in meteorology, since the principle on which it has been founded is undoubtedly very perfect and satisfactory. I do not, after a very critical examination, and experience in the use of the instrument, see any difficulty whatever in respect to its mechanism, which may not be easily conquered; and it only now remains to find what are the actual numerical values of its indications; that is to say, having been enabled to trace an annual movement of the air in the direction above seen, we should at the same time be enabled to determine the rate of the motion. This would seem at first sight a sufficiently difficult matter. I hope, however, to arrive at something like a fair approximation to such information, by the following mode of experiment, and which is now actually in progress. Before, however, I proceed to describe this, it may not be unimportant to make a few observations on the general methods of observing and registering the winds.

It will be perceived, on considering the ordinary methods of estimating the force of the wind by pressure on a given area, they are liable to this source of error, namely, that although the velocity of the wind may be the same in two or more cases of comparison, yet the indications of the force by pressure on a given area may greatly vary; and for this reason, the air at the times of observation may be more or less dense, that is, there may be a greater or less number of particles in a given space; and we can hence conceive that a dense air would press with a greater force than a rare air, although the velocity should be in each case the same. The force of any wind would really be its velocity multiplied into the number of aërial particles converging on the given surface. It becomes therefore requisite, in estimating the pressure of the wind, to take this into account. Further, it has been by no means proved, that the indicated force of a given wind would be proportionate to the area exposed to its action. The question, as a question of scientific meteorology, is really in its infancy, and demands considerable care and attention. We really require some terms more definite than those of a gentle wind, pleasant breeze, &c. I propose therefore carefully to observe the velocity and pressure of the wind on given areas, taking these circumstances into consideration, and so deduce from a vast series of experiments, general tables of reference, which may enable us to determine accurately the force of an aërial current, corresponding to a given velocity and density, as determined by the barometer.

Now, the force of the wind, as determinable by pressure on a given area, may be ascertained by a portable gauge I have recently contrived for the purpose, represented in the figure,



in which is a quadrant of brass, *d e*, set in a brass frame; the pressure plate *a*, drives back the rod *g*, confined between friction rollers, *h l*; *a* acts against the spiral spring *b*, by the silk thread passing over a pulley at the centre, *c*, attached at *k* to the end of the rod *g*, the pulley carries the index *f* higher up on the graduated arc *d e*, the greater the force of the wind. Lind's water gauge being observed at the same time, pressures on various areas at *a*, can be ascertained, and reduced to a known standard of weight. For ascertaining the velocity, the contrivance is a sort of throwing a log-line upon the air—a cork stuck round with feathers, like an umbrella, has a quill bushed with brass through its middle, and runs on fine iron wire—we may call it a wind log-line: and thus we can deduce tables, to bring into comparison the pressure, and velocity, and descent of the pencil on the anemometer.

Mr. HARRIS explained minutely the mode of experimenting with these instruments.

Prof. WHEWELL stated that the improvements introduced into his anemometer by Mr. Harris and Mr. Kerr had made the instrument very much more convenient and useful than he had hoped to render it. He still conceived, as when he first devised the instrument, that the annual type of the winds for each place, was the proper object of research, in order to obtain a scientific view of the course of the winds upon the globe, and that this annual type would be given by the anemometer now under discussion. This annual type would probably be much more regular in tropical regions than in these latitudes. There the annual cycle of atmospheric phenomena is very regular; here we have merely scraps and vestiges of a climate. Meteorology, as a science, might have had a very different history if it had first had its origin in tropical climates. With regard to the curve for Plymouth (July 1840 to July 1841), now exhibited, he observed that probably it might not be sufficient to take the straight line, giving the first and last priority, but the curve, as given by an average of several years. He was very glad to hear that Mr. S. Harris intended to employ himself in determining the merit of his anemometer, which was a necessary step towards completing the instrument. —Prof. PHILLIPS said, that it was, in his opinion, highly probable that these experiments were the commencement of a series which would at length lead us to a geographical map of the distribution of atmospheric currents, by which our knowledge of those more irregular movements of higher latitudes would soon become as precise as that of the trade winds and monsoons at present. He proposed to try the effect of the instruments suggested by Mr. Harris, on calm days on railroads, where the speed of the carriage was easily ascertained, and by trying them backwards and forwards, the effect of the atmospheric current would be eliminated.—Mr. OSLER detailed to the Section several experiments which he had performed on railroads, as suggested by Prof. Phillips.—Dr. ROBINSON was not entirely satisfied that this was the mode of exhibiting to the best advantage the results of this instrument. If we are confined to a graphic representation on a plane surface, we can only represent two variables: but three seem to be requisite. Mr. Whewell's anemometer measures the *quantity* of air which passes in given directions. Now we may represent the quantities and directions by a circle, in which the angle at the centre is the direction by compass, and the radius is the indication of the anemometer *in that direction*, not subducting those results that are opposed, as is done by Mr. Harris, but laying down the whole independently. But the time is thus left out; Mr. Harris's plan, of having different colours to mark the time, might indeed in part remedy this, but Dr. Robinson would rather apply *solid* representations: as before, laying down a circle divided into the points of the compass, and dividing its radius into equal parts to represent the time; on each point fix a vertical curve, of which the base is the time and the ordinate the velocity of the wind; then connecting them, we shall obtain a surface like the model of a country, in which the elevation would show the velocity, the bulk in the direction of a radius the quantity of translated air, and the direction of the ridges and depressions will mark the consecutiveness of winds. Such models would certainly be cumbrous, but might embody the results of the mean of several years of observation.

A paper was then read 'On the use of the Sliding Rule, with an Account of some new lines proposed for it,' by Mr. J. Bateman.—The paper was illustrated by a sliding rule with a radius of eight feet, the largest size yet graduated.

SECTION B.—CHEMISTRY AND MINERALOGY.

'A practical method of determining the quantity of real Indigo, in the Indigo of Commerce,' by Dr. Samuel L. Dana, of Lowell, U.S.

Dr. Dana directs that 10 grains of indigo, reduced to an impalpable powder, should be boiled in a Florence flask a few minutes, in 2½ oz. of a solution of carbonate of soda, making 30° to 35° on Twaddel's hydrometer, then add 8 grains of crystals of muriate of tin, and boil for half an hour: a beautiful yellow solution of indigo will be obtained. Withdraw the flask from the lamp, and introduce into the solution 500 water-grain-measures of a solution of 50 grains of bichromate of potash in 4000 grains of water. The indigo blue, with a trace of indigo red, will be precipitated, while the other components remain in solution. Filter the precipitate through a double weighed filter, washing the mass with 1 oz. of muriatic acid, diluted with 3 oz. of boiling water; wash with hot water till water only returns; separate, dry and weigh the filters; note the weight of the precipitate; burn one filter against the other; the difference is the silica contained in the indigo, which, deducted from the weight of the precipitate, gives the quantity of pure indigo.—Mr. Walter Crum, who communicates the above, adds, carbonate of soda with protoxide of tin does dissolve indigo, and forms a yellow solution, but so slowly, that he doubts if all the ten grains are acted upon. He thinks Dr. Dana must mean soda-ash, which contains a notable quantity of caustic soda; but a much weaker solution of caustic soda would answer the purpose.

'Abstract of a letter from Prof. Liebig to Dr. Playfair.'—This communication announced the discovery of a white crystalline substance, in large quantity, obtained by M. Schunk from the lichens which are employed in preparing archil (*Lecanora tartarea*, &c.) by extraction with ether. It differs from Erythrine and the compounds described by Dr. Kane, in its insolubility in water. It dissolves readily in alkaline solutions, and is capable of being again precipitated by acids, if the solution be recently made; but if kept standing for some hours, acids produce no precipitates: it has been decomposed, and is converted into carbonic acid, and *Orceine*. If the substance be dissolved in baryta water, and the clear solution boiled, a large precipitate of carbonate of barytes occurs, and the filtered solution gives, on evaporation, large quantities of *Orceine*. From this circumstance a number of phenomena in the colour of lichens can be explained, which Dr. Kane has described in his work on that subject. Prof. Liebig also states he has performed many experiments on the legumin of beans, and some other leguminous plants. He has arrived at the conclusion, that this body is identical with the casein in milk of animals. It has precisely the same composition, and contains the same salts—phosphate of potash, potash, magnesia, lime and iron—as the casein of milk. The Professor also mentions, that Dr. Will and Dr. Varrentrapp have devised an excellent method for determining the amount of nitrogen in organic bodies. The substance is mixed with a quantity of caustic potash, and hydrate of soda, and heated in an ordinary combustion tube to redness. All the nitrogen in the substance escapes as pure ammonia, which is condensed in a small and neat apparatus, containing dilute hydrochloric acid. This solution is mixed with chloride of platinum, evaporated to dryness in a water bath, and the excess of chloride of platinum is washed from the ammonia chloride by a mixture of ether and alcohol. From the metallic platinum which remains after the ammonia chloride is heated to redness, the quantity of nitrogen is to be calculated. In conclusion, the Professor states that he has repeated all the experiments of Dr. Brown on the production of silicon from paracyanogen, but is not able to confirm one of his results. His experiments prove, that paracyanogen is decomposed by a strong heat, into nitrogen gas, and a residue of charcoal which is exceedingly difficult of combustion.

Mr. PARNELL stated that he too had repeated the experiments of Dr. Brown, without being enabled to verify any one of his results.

'Some Experiments showing the possibility of Fire, from the use of Hot Water in warming Buildings, and of Explosions in Steam Engine Boilers,' by Mr. Goldsworthy Gurney.

After detailing several instances of fire which arose from the steam pipes of water apparatus used for warming houses, the author proceeds to describe some of the experiments likely to be of practical value. From a tubular boiler, driving a high pressure engine, the injection pump was cut off —half an hour after the supply pump was stopped, no water appeared on opening the gauge cocks, and the engine was observed to slacken its rate and to move sluggishly—it had dropped from 50 to 30 strokes a minute. The steam pipe from the boiler to the engine was 40 feet long, and was carried for convenience through the open air, thickly wrapped round with woollen cloth to prevent radiation: soon after the engine became sluggish, the woollen cloth was observed to char near the boiler, which soon extended along the whole length of pipe; the engine still working, but with more apparent difficulty, making only 16 strokes per minute; the pressure gauge, which usually ranged between 30 and 40 pounds, now stood at 15, and was gradually sinking. In about five minutes after the woollen cloth had charred, a lead flange, used as a packing at the cylinder joint, melted, and was followed by a loud escape of elastic matter. The engine stopped working, and on bringing a lighted match into the escapage, it took fire, and burnt with the lambent flame of hydrogen gas. The author's impression was, that the escaping vapour was not pure hydrogen. Water condensed on a piece of cold iron held in the flame, but no water condensed on the cold iron after the flame was extinguished. On examining the boiler, all the tubes were found red hot. This experiment was repeated with many modifications. The temperature of the escaping vapour was ascertained by means of bars, previously prepared to melt at different temperatures; these indicated a temperature of about 400°. In about eight minutes a piece of pure lead melted —woollen cloth was charred, and a piece of tow held in the escapage took fire. In other experiments it was found, that the pipes became sufficiently hot to explode gunpowder, and many chemical preparations. Having satisfied himself of this property of heated steam or elastic matter, formed from the last portions of water in a boiler, the author proceeded to examine, as far as possible, its chemical nature—to determine whether any decomposition, or new elementary formation, took place. He found that the elastic matter was not condensible over cold water, and would not in many cases burn, or show any indications of the presence of hydrogen, or other inflammable matters. In some experiments it was found it would extinguish flame. The experiments with copper vessels afforded the same results as those manufactured from iron. From these experiments it appeared, that whenever the heating apparatus falls short of water, the elastic matter formed over the fire will carry sufficient heat through close pipes, to any distance, to set fire to wood and other combustible bodies, and that whether the hot water apparatus be under pressure or not, or whether the heating surface be of tubes, plates, or cylinders. On the other hand it would further appear, from some experiments enumerated, that in no case is there danger when a given quantity of water is present. Mr. Gurney suggests, that if both ends of the circulating series in hot water apparatus, namely, the part which immediately goes from the heating surface beyond the furnace, and that part where the circulation returns to it before it enters the furnace, was made of a metal which would not melt at the fair working temperature of the water, but which would melt at a temperature of from 5 to 600° of heat (say lead pipe), there would be little, if any, danger from fire.

It was mentioned that some experiments made many years since, by Wolfe, on some of the boilers of the Cornish steam-engines, corroborated the facts now stated. It was also mentioned by Mr. HUNT, on the authority of Capt. Tregaskis, that where the boilers had been covered with sawdust, it was found in some instances, and in a very short time, to be charred.

'On the Disintegration of the Dolomitic Rocks of the Tyrol,' by Prof. Daubeny.

The author attempted to explain, without resorting to volcanic agency, the abrupt form, extraordinary height, naked outline, and fissured surface of the dolomitic rocks of the Tyrol. He attributed the above circumstances to the slow rate at which decom-

position proceeds in rocks, consisting of pure dolomite, and the strength of the cohesion which binds together the particles of this rock, owing to which, even those portions which stand prominent in consequence of the removal, by the agents of destruction, of their contiguous parts, often remain unaffected by those mechanical forces which would cause the projecting portions of a rock less unyielding in its texture to become detached. The cause therefore of the greater height maintained by the dolomites of the Tyrol, than by the pyroxenic rocks which accompany them, seems to be the inferior rate at which decomposition has proceeded in the former, whilst the bold and jagged outline they display, may have been produced by the tenacity with which their parts cohere. The sterile character of these same rocks, even in parts which are not precipitous, appears to be owing to the slowness with which they decompose, as well as perhaps to the absence of organic remains. The Professor concluded with some suggestions as to the means of fertilizing rocks containing magnesia, where from the slowness of their decomposition they continue sterile; and proposed in such cases to accelerate the disintegration, by pouring upon the subsoil diluted sulphuric acid.

Mr. Prideaux suggested that great advantage might be derived in the serpentine district of the Lizard, from spreading over the surface a thin layer of the iron pyrites, which being so abundantly supplied in the immediate neighbourhood would be very inexpensive. The decomposition which would ensue would afford sulphuric acid to combine with the magnesia of the rock, and oxide of iron, which is well known to be favourable to vegetation.—A Member feared the arsenic combined with the pyrites of Cornwall would render the use of them as suggested by Mr. Prideaux highly detrimental.—Dr. Daubeny remarked that Mr. Davies Gilbert had informed him, that water impregnated with arsenic was found to be anything but injurious to the growth of leguminous plants.—Dr. Daubeny also stated that he had made many experiments—watering plants with water containing arsenious acid, and that certainly it did not appear to him that it exerted any injurious influence, unless the water was very strongly impregnated with it.

'Some Inquiries into the Causes of the increased Destructibility of Modern Copper Sheathing,' by Mr. Prideaux.

In May 1840 Mr. Prideaux was applied to by Mr. Owen, of Her Majesty's dock-yard, to analyse some sheet copper from the sheathing of the *Sanspareil*, which had been on thirty years, and was still in good condition. The sample gave about 0.25 per cent. of alloy, chiefly zinc and tin. This contrasted well with a sample rendered unserviceable in a very short time (in only one year), and in which no quantity of alloy sufficient to weigh had been found; and the two agreed with two recorded analyses of Sir H. Davy and Mr. R. Phillips, the former having detected, in a very good sample of sheathing, about $\frac{1}{400}$ of tin; the latter having found the sheathing of the *Tartar* frigate (almost destroyed in four years, though never out of Sheerness harbour,) the purest copper he had ever analysed; and further with the reputed inferiority of the recently prepared sheathing of the Royal Navy, which must have been much purified by the repeated fusions it has undergone. The inference adduced was, that the presence of tin and zinc was favourable to the durability of the copper. Mr. Prideaux, however, proceeded with the analyses in other cases. Four were selected, viz.

From the	Copper on	Annual loss.
Minden	17 years	0 45 per cent.
Plover	only 5	11

Linnet, copper rapidly destroyed, could not be taken off sound enough to weigh a sheet.

New-sheathing prepared at Her Majesty's mills, Portsmouth.

There was no conformity between the results in these and the former experiments; they did not show any coincidence between the composition of the sheathing and its durability. The next step, therefore, was to examine how far it might be referred to any of the physical properties of the metal. To ascertain this, slips from each sample, all of equal surfaces (4 + 0.5 inch), were immersed each in a pint of sea water: the five vessels being placed side by side, so as to set them all in like conditions. Sea-water being electro-neutral, and acting *slowly* on copper, a little sal-ammoniac was added, to quicken the action without affecting the neutrality. The greatest waste was on the *Sanspareil'* copper, which had worn the best of all; the least on that of the *Plover*, one of the worst. Thus, in the laboratory, under parallel circumstances, they do not observe the same order of durability and waste as they had done in use. The cause of comparative waste appears, therefore, to be in part at least, due to *external conditions*, and of these two classes may be noticed: one depending on the connexion with the ship, the other on the circumstances of her employment. Of the first class two suggested themselves—the position on the ship's side, and the nails by which the copper is fastened. The lower part of a ship's copper seems to suffer much less than the upper, so long as she continues in deep water; but when she grounds at low water, if on black mud, this part suffers most from the action of sulphuretted hydrogen, peeling off in blue flakes. The influence of the nails offers rather more chemical interest. They are never of pure copper, and being very numerous, all in contact with the copper sheets, whilst their heads present also a considerable metallic surface to the salt-water, they may produce very decided effects, either preservative or destructive, by a slight electro-chemical difference. Mr. Prideaux therefore examined a vessel which they were just then stripping, her copper being worn out in four years. It was found that round some of the nails the copper was quite entire, for an inch or two, though worn ragged in other parts; whilst elsewhere, and sometimes on the same sheet, the copper round other nails was quite gone, though other fragments of the sheet remained. Here some of the nails appeared to have exerted a protective, others a destructive influence. To ascertain the effect of the nails, five slips of new copper from the same sheet, and of the same size, were suspended equidistant, and at the same depth, in a vessel of sea water from the West Indies. The result was, that all the nails, except one (which was from Her Majesty's dockyard), appeared to act destructively. Here appears to be *one* instance of a protective nail, not enough so to prevent all waste of the copper, which experience has shown not to be desirable; but doubtless the preservative power may be increased to any requisite degree by attending to the composition of the alloy. The copper is alloyed chiefly with tin; but if the nail is at once hard and flexible the manufacturer is satisfied without examining what other metals are present. If they were always made just so much electro-positive to the copper as to protect the sheathing, so far as compatible with their own durability, they would seem to offer the simplest, most perfect, and most convenient means of electro-chemical protection. The damage to which the copper is subjected is affected by the circumstances of the ship's employment. Sheathing suffers most where most subject to wash and air, for friction is an agent in the waste as well as oxidation. It is also well ascertained that the copper sheathing suffers most in hot climates, which might be expected, upon a common chemical principle, that chemical action increases with the temperature; and it became a question whether this effect of heat, as well as its tendency to promote organic production and decomposition, might not form an important element in this destructive agency. Mr. Prideaux therefore obtained water from different parts of the Gulf Stream, with and without the weed, from the Caribbean Sea, and from Falmouth harbour, where the packets moored, the waters of which might possibly be affected by the mine drainings discharged into the river. Whilst these were being collected, Prof. Daniell's announcement of large quantities of sulphuretted hydrogen in the waters of the Guinea coast came before the public. To try the action of these different waters five copper slips, of the same dimensions, cut from the same sheet, were suspended in a pint each of the following samples of water:

1. Heart of the Gulf Stream.
2. Do. with the weed.
3. Caribbean Sea.
4. Falmouth harbour.
5. Plymouth harbour.

After thirteen days they were taken out and re-weighed, having been put in all bright, but cleaned, on taking out, only with a brush in soft water, as in the other experiments:—

	1.	2.	3.	4.	5.
Put in 16th	180.26	182.56	190	169.01	176.41
Out 29th	178.45	182.3	189.6	168.55	176.1
Loss in 13 days..	1.81	0.26	0.4	0.46	0.31

No. 1. came out clean and bright, the others with tarnished surfaces, except No. 2, which was blotched and speckled. The Falmouth water presented no indications of being more corrosive than that of Plymouth, and Mr. Prideaux attributed the great difference of waste in these two cases to some unobserved difference of conditions in the experiment. But the excessive action of the Gulf Stream water, he considered too decided to be doubtful. Not only the quantity wasted, but the metallic clearness of the surface, showed a marked distinction. "But to whatever extent the recently increased waste of sheathing may fairly be charged upon the greater velocity, more constant employment, and greater consequent liabilities of weather and climate of our ships, particularly of the commercial classes, as well as to difference in the nails, I am inclined," said Mr. Prideaux, "to fear the fault is still to be sought in the copper itself. I have it on the authority of Mr. Moore, that the *Quarantine* cutter, generally at anchor in our harbour, was coppered in October 1832, and her copper is now in a very good state. Her last sheathing held good fourteen years. The Eddystone tender, which also moors in Catwater, was coppered in July 1838, and is now in much worse condition than the *Quarantine*, which has been on six years longer. That the waste on the Eddystone tender is not owing to her work, is evident, from the fact, that the upper part of her sheathing, which suffers the wash and friction, continues sound, whilst from beneath her floor the copper peels off in blue flakes. That this is attributable, in a great degree, to her occasionally grounding upon the black mud, which generates sulphuretted hydrogen and other corrosive matters, is very probable; the other never grounds, and does less work. Yet the difference is too great to be thus satisfactorily accounted for. The one is in good condition for nine years, the other comes to patch before the end of three: both lying the most of their time in the same harbour. On neither was there any distinct indication of protective or destructive influence in the nails." "Meanwhile, as nails must be used, and present a large metallic surface to the salt water, as well as numerous points of contact with the copper, calculated to give great effect to small electro-chemical differences, either in protection or destruction, it would seem that we ought to render them slightly electro-positive to rolled copper, by the addition of zinc, which would not injure their flexibility nor enhance their cost. The test, by the galvanometer, would be easily applied (after a little practice) in making up the metal for casting them, if it is of importance to continue the present system of their manufacture."

There is another method of protection, which came out in the course of these investigations; and which is beginning to occupy public attention. It was before noticed, that the upper part of the copper on the Eddystone tender, which bears the wash and friction of the waves, continues sound; whilst the bottom is fast wearing out. This exception, or rather subversion of the usual conditions, is owing to a coat of fish oil, laid on when the copper was new, to keep it bright; and not extended over the parts out of sight. Such a permanent effect could never have been anticipated from an oil which is not drying, and strongly indicates the facility, as well as efficacy, of this mode of protection. A still more striking case presented itself in the vessel which supplied the observations on the apparent influence of the nails. During our examination, we observed the complete preservative effect of some coal tar, which had trickled down over the copper, from the wood-work above. This had crossed the sheets just where most subject to the wash and friction; and whilst the naked metal had been quite worn away, the coal-tarred streaks remained entire, the surface of the copper, on melting off the tar, being as perfect as when fresh from the roll. Hence coal tar seemed to be an efficient preservative; but then recurs the question—will it keep a clean surface, free from organic adhesions and earthy incrustrations? To embrace the opportunity for experiments, the vessel was sheathed with copper on one side and yellow metal on the other; and her fore-quarters to her mid-length varnished with coal tar, laid on hot, upon the metal also heated, by fires of chips round the sides. She has now been twelve months at sea; and, according to the last account, the varnished as well as the metallic surfaces, kept quite clean.

'New extemporaneous process for the production of Hydrocyanic Acid for Medical Use,' by R. D. Thomson, M.D.

The importance of prussic acid as a remedial agent, has induced the author to bestow much attention upon the production of this acid, so as to obtain it always of uniform strength. Having submitted to trial all the processes which have been recommended in this country, for the formation of prussic acid, the author was satisfied that no one of them afforded an acid of always uniform strength. The process recommended by Dr. Clark, of Aberdeen, was superior to every other, but an objection to his process was the great difficulty of procuring pure cyanide of potassium. The author believes the following process to be less liable to objection than any at present used. The first step consists in forming a pure cyanide of lead. This object may be effected in various ways, either by precipitating acetate of lead by hydrocyanic acid, as prepared from the ferrocyanide of potassium, and sulphuric acid, in a stoppered bottle, or by distilling the mixed materials into a Wolf's bottle, containing a solution of acetate of lead. In either case a definite compound of cyanogen and lead will be obtained, which is to be carefully washed and gently heated. The next step in the process consists in decomposing it, by means of sulphuric acid. In order to obtain an acid of the strength of the *Acidum Hydrocyanicum dilutum* of the London Pharmacopœia, or containing about two per cent. of absolute acid, the following formula is recommended:—

43.36 grains of cyanide of lead.
2 fluid drachms of dilute sulphuric acid, London Pharmacopœia.
6 fluid drachms of pure distilled water.

Introduce the cyanide of lead into a stoppered bottle; mix the acid and water in a glass vessel, allow the mixture to cool, and then pour it upon the cyanide of lead. Close the stopper, and agitate the fluid and salt together. After standing for some time, pour off the supernatant liquor from the precipitated sulphate of lead, and preserve it in a stoppered bottle. This formula is founded upon the circumstance that the dilute sulphuric acid of the London Pharmacopœia contains in each fluid drachm about 9.5 grains of oil of vitriol—

$$(S\,O_3\;H\,O).$$

2 drachms will therefore contain 19 grains of oil of vitriol. The quantity required for saturating 43.36 grains of cyanide of lead is only 17.4 grains, but the small excess is useful in preserving the acid.

Section C.—Geology and Physical Geography.

Prof. Owen communicated the second and concluding portion of his 'Report on British Fossil Reptiles.'—After some prefatory observations on the general nature and affinities of the recent and extinct reptilia, and the parts of the organization of the latter which by their modifications afforded the best character for their determination, the author proceeded to give a recapitulation of the leading peculiarities of the Enaliosauri, which formed the subject of the first part of his Report; and a brief summary of the results of the labours of previous geologists and anatomists, in the field which the second part of his Report had led him to explore. The first section of the Report was devoted to a description of a large reptile, the type of a new genus, to which the name Pliosaurus was given, and which formed the link connecting the Plesiosaurus with the Crocodile family. The most conspicuous character of this genus consists in the cervical vertebræ, which are considerably shorter than those of the dorsal region: in this respect it differs from all recent Saurians, the vertebræ of which are characterized by retaining the same length throughout. From this cause the neck of the Pliosaurus is short, compared with that of the Plesiosaurus, and approaches the condition of that region in the Ichthyosaurus. The more Crocodilian proportions of the teeth also distinguish it from the Plesiosaurus, which in other respects it strikingly resembles. Remains of it have been found in the Kimmeridge clay of Market Rasen, Weymouth, and Shotover. From differences in the relative proportions of these bones, Prof. Owen considers them to have belonged to two distinct species of Pliosaurus. The remains of the Saurians of the Crocodilian family, which complete the transition from the Enaliosaurians to the terrestrial Lizards, were next noticed. The Report included descriptions of the fossil Crocodiles in the British formations below the eocene tertiary strata to the oolite inclusive; and it was observed, that the extinct species deviated from the organic type of the existing crocodiles in proportion as their remains occurred in strata geologically more remote from the present time. Not any of the species were identical with those now known to exist, and the modifications of structure in which they differed, were much more considerable than any which distinguish the skeletons of the existing species from each other. The extinct species, agreeing with the present crocodiles in possessing the ball and socket articulation of the vertebræ, in which the cavity is on the fore part, were first described. Of these, the *Crocodilus Toliapicus* is found in the London clay of Bracklesham, at Sheppey, and in beds of sand underlying the red crag at Kyson. The *Crocodilus cultridens* of the Wealden formation Prof. Owen now considered subgenerically different from the crocodiles, and proposed for it the name of Suchosaurus. *Goniopholis crassidens*, another species from the Wealden, was described by Prof. Owen as more completely mailed than any of the crocodile family; its remains occur in the Tilgate Forest and near Battle Abbey, and in the Purbeck limestone at Swanage. The next family of extinct Crocodilians considered by Prof. Owen, are characterized by the biconcave structure of the vertebræ. Remains of the first of these, *Teleosaurus Chapmanni*, are abundant in the lias of the Yorkshire coast; and *T. Cadonensis*, which abounds in the oolitic formations near Caen, in Normandy, also occurs in the oolite near Woodstock, and at Stonesfield. Remains of two other species were noticed. The second genus, Steneosaurus, distinguished from the last by the sub-terminal position of the nostril, is from the Kimmeridge clay at Shotover, and from the oolite of Stonesfield. One of the most interesting specimens, exhibiting the form of the brain in a cast of that part, is in the Woodwardian collection at Cambridge. A third division was for the first time described as occurring in British strata, possessing the ball and socket articulation of the vertebræ, but with the position reversed, to which the name Streptospondylus has been given by Von Meyer. It has been found in the lias near Whitby, and the oolite near Chipping Norton. Prof. Owen next proceeded to describe the remains of some gigantic Saurians, ranging from the greensand to the oolite, and rivalling the modern whales in bulk, may be presumed to have been of strictly aquatic, and probably of marine habits. They possess the biconcave structure of the vertebræ, and the long bones show no trace of a medullary cavity. Of the first of these, named by Prof. Owen Cetiosaurus, (described in report of Proc. Geol. Soc.), the vertebra and other bones, found in the lower oolite of Chipping Norton, belonged probably to an individual forty feet in length. Mr. Owen has assigned to this species the name of *C. hypoolithicus;* and to another species the name of *C. epioolithicus*, remains of which, including a vertebra eight inches in length of body, and nine inches in transverse diameter, occurs in the Yorkshire oolite at White Nab. The ninth section of the Report was devoted to the description of a large marine Saurian, teeth of which were frequent in the chalk of Barnwell, and in Sussex, in the Folkstone galt, and the lower greensand near Maidstone. From the structure of the teeth, Prof. Owen had assigned to it in his 'Odontography' the name of Polyptychodon. Several bones of a gigantic Saurian, discovered by Mr. Mackeson in the greensand quarries near Hythe, were considered as probably belonging to the same genus. Mosasaurus—of this genus only a few vertebræ have been found in the English chalk formation. Teeth, resembling those of the Mosasaurus, but differing in the elliptic form of the base of the crown in a transverse section, have been found in the chalk of Norfolk, and were described by the generic appellation Leiodon. The Report next proceeded to the account of the extinct species, which manifested, in the enduring parts of their organization, an intimate relationship with the numerous and varied tribes of the smaller and lower organized Saurians of the present epoch, to which the terms Lacertians, or Squamate Sauria, were applied. And Prof. Owen observed, that in this as in the foregoing divisions of the Saurian order, the ancient world possessed very singular and also very gigantic species, which have now utterly perished, and have given place to carnivorous and herbivorous quadrupeds of more active habits and a higher organization. The first fossils noticed were referred to a small genus of Lacertians from the Chalk formation in Cambridge and Maidstone, to which Prof. Owen had given the name Raphiosaurus; a portion of the lower jaw, containing twenty-two awl-shaped teeth, and another specimen consisting of twenty dorsal, two lumbar, two sacral, and a few caudal vertebræ, with the pelvic bones, were described. Part of the lower jaw, with teeth, of another Lizard, about the size of the Iguana, was described as occurring in the eocene sand under the red crag at Kyson. Remains of a Lacertian were next described, from the celebrated oolite at Stonesfield. The structure of these bones indicates a close affinity to the Scincoid Lizards, the largest forms of which now exist in Australia, where they are associated with Araucariæ and Cycadeous Plants, with living Clavagellæ, Terebratulæ, and Trigoniæ, and with the peculiar marsupial quadrupeds, the remains of all which forms of organized beings characterize the same stratum and locality as does the present extinct Lacertian. Prof. Owen next proceeded to notice the more remarkable and gigantic forms of terrestrial Saurians of the same period, from the eocene tertiary to the oolites. Of these, the Megalosaurus, Iguanodon, and Hylæosaurus, had been described by their original discoverer, Dr. Mantell, and by Dr. Buckland in his 'Bridgewater Treatise.' Prof. Owen, after pointing out additional peculiarities of structure discovered in specimens subsequently found, and the new localities from which these specimens were derived, observed that the name Iguanodon, by conveying the idea of a gigantic Iguana, created an erroneous idea of its affinities. No existing lizard differed more from the Iguana than did the Iguanodon, in the absence of the ball and socket joint of the vertebræ, and likewise in the structure of the teeth, which is characterized in the gigantic extinct herbivorous reptile by numerous parallel medullary canals. The femur of the Iguanodon, in the process continued from the inner side, near the upper third of the bone, deviates from all modern Lacertians, and approaches nearer the crocodiles, but surpasses them in the developement of the ridge in question. A detailed description of the skeleton, founded upon nearly all the remains of the Iguanodon yet discovered, was next given; the form of the claw-bones of the Iguanodon, and especially of some enormous ones recently discovered with other bones at Horsham, was described, and from a comparison of these with other specimens from the Isle of Wight, and with those preserved in the slab containing the Maidstone Iguanodon, Prof. Owen stated it to be his opinion, that the Iguanodon did not possess the peculiarity of having the fore legs provided with compressed, and the hind legs with depressed claws, but that the narrow compressed curved claws occasionally found in the Wealden belonged to another extinct reptile. This section of the Report concluded with a notice of all the British localities, and the strata in which those remains had been discovered. The anatomical peculiarities of the Hylæosaurus, another large extinct reptile of the Wealden clay, discovered by Dr. Mantell, were next described; and an account of the microscopical structure of the dermal bones was given. This remarkable reptile combines the sub-biconcave structure of the vertebræ, with Crocodilian scutæ, and a plesiosauroid form of the scapular arch. The teeth not uncommonly found in the Wealden strata, formerly supposed to belong to the *Phytosaurus cylindricodon* of Jaeger, and more recently to the genus Rhopalodon, of Fischer de Waldheim, Mr. Owen showed to be quite distinct from both, and stated that if they were not the teeth of the Hylæosaur, they must belong to some unknown genus of Lacertine Saurian. The remains of the genera Thecodon and Palæosaur, from the magnesian conglomerates near Bristol, and of the genus Cladeiodon, from the keuper sandstone of Warwickshire, were next described. These were the most ancient of the Saurians yet discovered in Great Britain, and although they differed from modern Lacertians in the implantation of their teeth in distinct sockets, agreed with them in the form and structure of the teeth. The last genus of Saurians described (*Rhynchosaurus*, O.) was new to science, and the remarkable peculiarities of its cranial anatomy, together with its vertebral characters, and the structure

of the ribs and some of the long bones, were given in detail. Characters of the crocodile, lizard, and tortoise were combined in the forms and connexions of the bones of the skull, a nearly entire specimen of which had been transmitted by Dr. O. Ward, of Shrewsbury, to Prof. Owen, from the Grinsill Quarries of the new red sandstone, where the foot-prints of a reptile, agreeing in size with the Rhynchosaurus, were not uncommon. Reasons were adduced showing the high probability that they were the foot-prints of the Rhynchosaurus; they differ in shape from those of the Chirotherium, which were shown, in the concluding part of the Report, to belong to Prof. Owen's new genus Labyrinthodon. In the seventeenth section of the present Report, the remains of the Flying Reptiles (*Pterodactylus macronyx*) from Lyme Regis and the oolite of Stonesfield, were described. Some remains of undetermined Saurians, from the bonebed at Aust Passage, and other localities, were noticed. The nineteenth section of the Report contained an account of the fossil Emydes, Trionyces, and Cheloniæ, hitherto discovered in British strata. The *Chelonia Harvicencis*, and two new species (*Chelonia breviceps* and *Chel. acutirostris*) from the eocene clay at Sheppey, were described; and the characters of a new genus (Cimochelys), the remains of which are found in the chalk near Maidstone, were given in detail. The indications of Chelonian reptiles in more ancient strata were then noticed, and the femur of a tortoise, from the new red sandstone near Elgin, was described. The fossil reptiles of the order Ophidia, discovered by Mr. Owen in the London clay at Sheppey, have already been noticed; to these were added descriptions of a smaller species of Palæophis, from the eocene sand at Kyson; and of a much larger species, not less than twenty feet in length, from the London clay at Bracklesham. The last section of the Report was principally devoted to the details of the determination of remains of the fossil Batrachians, identical with the so-called genera Mastodonsaurus and Salamandroides of the German keuper, and on which the characters of the genus Labyrinthodon are based. Reasons were given, showing the high probability that the foot-prints referred to the Chirotherium, were those of the Batrachian genus Labyrinthodon.

Mr. W. Sanders exhibited sections of the Railway between Bristol and Bath, a distance of twelve miles. The first was in length thirty-six feet, being at the rate of three feet to the mile. The others were enlarged sections of four portions of the railway, made on the scale of forty feet to one inch. One of these represented a cutting, one mile in length, at Saltford, through the successive strata of the lias formation. This cutting was described by detailed sections on the scale of four feet to the inch; each bed is noticed with, as far as possible, its included organic remains. The subdivisions are, the upper marl upon upper and lower blue limestones, 58 feet; white limestones, 24 feet, and lower marl 27 feet; which latter were shown, by means of sinking a pit, to rest upon new red marls. Drawings of certain fossils were added. Three other enlarged views of the Pennant strata were given, with further details in sections, on a scale varying from 20 to 10 feet to the inch. Drift beds were noticed containing water-worn fragments of sandstone, broken stems of plants (*Sigillaria lepidodendron*), with rolled pieces of perfectly formed coal: also conglomerates of broken coal. Drawings were made of two large Sigillariæ, taking origin in a bed of coal; and a portion of two large slabs of the Pennant sandstone showing very regular ripple marks. Various other geological phenomena deemed worthy of attention were displayed on the sections.

'On the genus Cardinia, Agassiz, as characteristic of the Lias formation,' by H. E. Strickland.—Mr. Strickland called attention to a genus of bivalve mollusca which is peculiarly characteristic of the Liassic series. This genus, which was named Cardinia by M. Agassiz, in the 'Études critiques sur les Mollusques fossiles,' has also been termed Pachyodon by Mr. Stuchbury, and Dihora by Mr. J. E. Gray. It appears to belong to the Veneridæ, and in external form approaches Pullastra, but is distinguished by possessing, in addition to the converging cardinal teeth, a pair of very strong lateral ones, analogous to those of Cardium. From the ovate form of the shell and the structure of the hinge, the species of this genus have been referred by most authors to the Unionidæ, but are sufficiently distinguished by the cordiform depression beneath the *umbo*, and by their marine habitat, as proved by the other fossils found in company with them. Ten or twelve species are known of this genus, the whole of which occur either in the marlstone or the lower lias. Seven of these species were exhibited, but as it was understood that Mr. Stuchbury proposed publishing a monograph of the genus, Mr. Strickland abstained from naming them before he had communicated with Mr. Stuchbury. The best known type of the genus is *C. Listeri*, (*Unio Listeri*, Sowerb. Min. Con.)—Mr. Strickland also exhibited the unique specimen of a dragon-fly's wing from the lias, the property of Mr. Gibbs, of Evesham.—Mr. S. P. Pratt stated that he had found most of the forms of Cardinia exhibited by Mr. Strickland in *all* the beds of the Liassic series.

'On the discovery of Organic Remains in a raised Beach, in the Limestone Cliff under the Hoe, at Plymouth,' by E. Moore, M.D.—The raised beach discovered under the Hoe, by the Rev. R. Hennah, has lately, by the extension of the quarry near which it was situated, been almost entirely removed, and, in the progress of the work, it was ascertained to occupy a depression in the face of the limestone cliff, 100 feet wide and 40 deep; its base is 35 feet above the present sea at high water spring tides; it runs upwards and backwards 20 feet, inclining inwards with the slope of the rock, and is covered by 10 feet of gravel, thus making its entire elevation 65 feet above the present sea level. It is composed of fragments of rocks of the neighbouring shore, such as limestone, slate, red sandstone, and reddish porphyry, together with quantities of granitic sand, which is arranged in consolidated horizontal layers or false bedding, with intervals of loose sand: a few shells (as patella and buccinum) have been found in it; and recently, on its upper part, 10 feet below the surface of the present soil, were discovered bones and teeth of the elephant, rhinoceros, bear, horse, and deer; also caudal vertebræ of the whale, and valves of a large oyster. The quantity of fragments of leg bones amounted to several bushels, being exceedingly fragile, and deprived of their animal matter; the whale's vertebræ and bear's tusks appeared much worn, as if by long continued friction in water. Above, and to the west of this deposit, 88 feet from the present sea, is another accumulation of rounded quartz pebbles, ironstone, and sandstone, imbedded in a matrix of white clay, apparently differing altogether in character from the former, and assimilating to the deposits noticeable higher up the country, about Haldon and Blackdown. The author described a continuation of the same accumulation, several hundred feet to the westward, on a level with its lower line, composed of rounded masses of large size, mixed with sea sand, containing numerous fragments of purpura, patella, buccinum, &c., all similar to the mollusca of the present sea; and then mentioned numerous instances of similar deposits occurring all around the shores of the harbour of Plymouth. Nearly the entire collection of bones was similar to those formerly obtained from the limestone caverns of Oreston, Yealm Bridge, Kitley, and Kent's Hole, all in this county; and inferred that the beach must have existed as such at the time when the animals of the caverns were in a living state. That it was really originally washed by the sea he considered proved by the rounded form of the vertebræ of the whale and many of the bones; also, from the marine shells deposited in it, he believed that there must have been an elevation of the land at some former period taking place slowly, not by any sudden convulsion likely to destroy the animals then existing.

Dr. Buckland contended, that the deposit forming the subject of this memoir, was not properly a raised beach, but simply a diluvial deposit coming down to the sea, and exposed by its inroads upon the cliffs; he remarked upon the absence of rounding in the joints, and the great thickness of the deposit, and mentioned the difficulty he and M. Agassiz had experienced in Scotland in identifying glacial moraines where they came down to the sea and were parallel to it, presenting an appearance similar to that of raised beaches. He considered the total absence of bones of the age of the caves, as an essential character of raised beaches, whilst in the diluvial deposits he should expect them to occur, many of the caves being no more than fissures into which bones had been drifted.—Mr. J. Smith, of Jordan Hill, expressed doubts as to the cave bones belonging to the marine gravel; he considered they might easily have been mixed with the detritus of a beach by the destruction of a cave, owing to inroads of the sea. This would account for the absence of trituration in the cave specimens, whilst the associated cetacean bones were rounded by the action of the waves.—Mr. Austen referred to the raised estuary deposits in the valley of the Ex, contemporaneous with the raised beaches, above which there were diluvial deposits of gravel with bones. He inferred, that during the period when the caverns were occupied by the hyæna and its contemporaries, the country was at a higher relative elevation than during the subsequent period, in which the raised beaches were formed.—The Rev. D. Williams stated that the deposit under consideration comprised two distinct formations. On the summit of the cliff was the raised beach, consisting of pebbles from the Sound, and precisely resembling the shingle on the present shore. Patella occurred attached to these fragments, and buccinum and other shells mixed with the pebbles, and bones derived from some cave. The deposit above this, ten feet thick, consists of northern drift, containing fragments of Coddon Hill grit, and other transported rocks, quite different from those in the raised beach and on the present coast.

Section D.—Zoology and Botany.

'Scheme for yearly Observations on the Periodicity of Birds,' by M. Edm. de Selys Longchamp, of Liege.

The author recommends that cultivators in all branches of physical science should carry on simultaneously in their several departments, a journal of periodical phenomena. The project has been warmly embraced by the Zoologists and Botanists of Belgium, and in their name, M. de Selys Longchamp invites the naturalists of other countries of Europe, to co-operate in endeavouring to ascertain how far the arrival of certain animals and the foliation and inflorescence of plants, are promoted or retarded by the condition of the atmosphere in each year. In this paper he addresses himself exclusively to Ornithologists, showing them that of the annual route of swallows, cranes and many other birds which migrate to great distances, we can only speak vaguely from the want of comparative observations, and he recommends that for the present, our observations should be chiefly directed to birds which spread over the whole, or nearly the whole of Europe. He also assigns his reasons for selecting terrestrial birds in preference to aquatic kinds, and proposes that the precise dates of arrival and departure should be recorded from the beginning of the year 1842.

'A comparative view of Animal and Vegetable Physiology,' by Mr. Bartlett.—A comparison was drawn between plants and animals in the processes of digestion, circulation, respiration. The necessity was dwelt on of never losing sight of organic media, and the actions they produce, and of an invisible vital principle, which pervades, not only every fibre in the muscular or cellular organism, but every atom of each fluid. The fact of the existence of two great antagonizing principles, in the organic and inorganic kingdoms was pointed out, and their progressive developement in the history of the world was shown by means of a diagram. Descriptions were given of the comparative circumstances under which the germs of animal and vegetable life are first developed, the conditions of the embryos, &c. The nerves and sensorial powers of animal tissues, and of their supposed analogies in vegetation, were described. The influence of climate, light, &c. on the vegetable and animal kingdoms was considered, and a contrast drawn between the vegetation of the poles and the equator.

Dr. Lankester observed, that great care should be taken in generalizing upon a subject like that of the identity of functions in animals and vegetables. That there was an identity of structure in organized bodies in the early stages of their growth, the researches of Schleiden, Schwann and Barry had, he thought, proved. But as the members of each become more developed, they become more dissimilar; hence the difficulty of making analogies between their functions. The sap was not the analogue of the blood, but possibly the latex was. The existence of a nervous system in plants, was altogether an hypo-

thesis destitute of every thing like proof. The motions of the leaves of certain plants were more like the irritability of muscular fibre, than the sensation and volition which were the result of nerves in the animal. The process of excretion from the roots of plants, was not analogous to that of excretion in animals. The inferences of Macaire and De Candolle from their experiments on this subject were premature. The deposits in question from the roots of plants, consisted of materials which were in superabundance in the system of the plant. The reason why the same species of plants would not grow one after the other, was that the first exhausted the soil of the materials necessary for the nourishment of the next. In some parts of the world, wheat crops had been obtained fifty years in succession, where the supply of nutriment was sufficient. Liebig in his late work on Organic Chemistry had admitted on too slight grounds the correctness of Macaire's and De Candolle's views with regard to root-excretions.—Dr. RICHARDSON referred to the late discovery of the means of colouring the wood of trees, by introducing colouring matters into their trunk; and one remarkable fact connected with this, was, that the colouring matters were thrown off from the roots, and poisoned plants surrounding them, although the plant coloured continued to grow.—Prof. HENSLOW said, with regard to the subject of excretion, that he thought it one of great interest and worthy further examination. Link, and other botanists on the continent, had doubted its existence, and brought fatal objections to the correctness of De Candolle's conclusions from Macaire's experiments, which he thought Liebig had admitted too easily.

The Report of the Committee for the 'Engraving of Skeleton Maps for recording the Distribution of Plants and Animals,' was now read. In substance it stated that the delay in applying the maps practically, had arisen from the various suggestions for their improvement: that the details will now be forthwith carefully revised—and that but a small part of the grant had been applied.

Dr. THEOPHILUS THOMSON exhibited two living specimens of Lepidosiren which he had taken in M'Cartney Island on the Upper Gambia. They were found lying imbedded in a hole in the rock, from which they could only be removed by a hammer. They were always covered with a coat of mud, which one of the specimens still retained.

'Remarks on the Flora of Devon and Cornwall,' by the Rev. W. S. Hore.—Jones's 'Flora Devoniensis,' published about twelve years ago, has served as a basis for the Flora of the two western counties of Devon and Cornwall, which from their position form one of the districts into which Great Britain would naturally be divided by the geographical botanist.—The number of phanerogamous species recorded by Jones is 774: 41 additional species are now enumerated for Devon and 31 for Cornwall, which would raise the number of plants indigenous to the two counties to 846. The most interesting discoveries since the time of Jones are *Arthrolobium ebracteatum*, *Trichonema columnæ*, *Viola Curtisii*, *Chrysocoma Linosyris*, *Trifolium Bocconi*, and *Hypericum linarifolium*. *Physospermum Cornubiense*, hitherto supposed to be limited to the neighbourhood of Bodmin, is now mentioned as growing near Tavistock in Devon. The old habitat of *Scirpus Holoschœnus* on Brampton Burrows has been destroyed by the shifting of the sand. A new spot where the plant is in some abundance has, however, been exposed by the same cause. It is not improbable that ere long it may become extinct.

Mr. BARTLETT stated that the *Cynosurus echinatus* was very abundant on the Hoe, and could not be an outcast from gardens, as Mr. Hore supposed.

Dr. LANKESTER exhibited a drawing of a monstrous rose he had received from Mr. Henry, of Leeds. The pistil had become a perfect branch.—Mr. LITTLETON, of Saltash, also exhibited a common pear, in which a smaller pear had grown from its apex.—Prof. HENSLOW observed that all these specimens proved the correctness of the doctrines of morphology. It was now generally admitted, that all the parts of a plant were modifications of the leaf, and consequently might revert to that state. He had seen a branch formed from the pistils of *Digitalis purpurea*.

SECTION E.—MEDICAL SCIENCE.

Dr. Roget in the chair.

The Secretary read a communication from Mr. J. V. Solomon, entitled 'Facts as yet unnoticed in the Treating of Squinting.'—The author related certain facts as coming within his observations, but offered no explanation of the phenomena.

'General Observations on the Pathology and Cure of Squinting,' by John Butter, M.D.

Dr. Butter pointed out the different kinds of squinting, their causes and treatment, then detailed the history of the new operation, and described the manner of performing it. The cases in which no operation should be performed, are those (he said) in which, when the sound eye is closed, there is no power of rotating the diseased one, but it remains perfectly fixed. Dr. Butter concluded by remarking on the great tendency to faint which exists in undergoing this operation, which is not observed in other and far severer operations on the eye, for cataract and other diseases.

Mr. BENNETT LUCAS observed, that as the fact of congenital squint was doubted, he could assert its existence, having found several such cases, as also several in which the deformity arose from imitation.

Sir DAVID DICKSON read 'A Case of Albuminous Ascites, with Hydatids.'—After having been discharged from hospital two years, previously relieved from dropsy, the patient was readmitted, labouring under excessive abdominal distension, but without œdema of the limbs. From his great suffering it was attempted to relieve him by tapping: but a small quantity of fluid came away, and in ten days he sunk; on *post mortem* examination, the abdomen was found to contain a quantity of semi-concrete matter, resembling soft calves' foot jelly, whilst a thinner effusion occupied the interstices between the intestines, and behind the viscera; there was much of it in contact with the surface of the thickened peritoneum, which appeared to send off processes to the different viscera, whence it escaped more slowly in masses, from being invested with a fine pellucid membrane. Similar cysts, more perfectly resembling hydatids, were attached to various organs, or were imbedded in their structure, especially in the spleen, which contained several hydatids in firmer cysts. These parasitic bodies also occupied various duplicatures of the peritoneum, and almost filled the pelvis; some of the smaller ones were attached to a layer in the viscera, to which they adhered by pedicles; they were of various sizes, from that of a nut to that of an orange, but they diminished in distinctness of organization as they increased in size. The liver and kidneys were small, rather soft, and pale. The jelly-like fluid coagulated by heat, and being tested with the nitric and acetic acids, and with tincture of galls, it was found to consist principally of albumen, with a smaller portion of gelatine.

Prof. WILLIAMS inquired if the cysts found in the spleen were detached or adherent.—Sir David replied that they were found in both conditions.—Prof. W. was inclined to look on the case as one of chronic peritonitis, and not of true hydatids, the characteristic peculiarities of which he laid down; they were in detached cysts, inclosed one within another, very transparent, containing a watery fluid, not gelatinous, with the cyst formed of very elastic tissue.

The Secretary read a communication from Dr. A. T. Thomson containing 'Observations on a pustular disease hitherto undescribed by writers on diseases of the Skin.'—From its resemblance to the genus Porrigo, the disease was named by the author *Porrigo serpiginosa rodens*. The eruption, unpreceded by marked derangement of habit, appears first upon the cheeks, in the form of a small group of minute red papillæ, seated upon an inflamed spot; a similar group may appear at the same time on the neck or upper part of the chest; these soon become pustules, out of which oozes a fluid, which dries into crusts, which extend, assuming an irregular circular shape. As the group of pustules extend, the crusts of those first formed drop off, and leave the cuticle depressed, similar to the depressions produced by confluent small-pox. After the continuance of the disease for some time, febrile disturbance shows itself, and a chronic spreading inflammation of the surface ensues. The description was illustrated by drawings representing it in its aggravated form, and also in progress of decay from appropriate treatment. The diagnosis, from other species of porrigo, and other pustular diseases, was minutely given, and a case detailed exhibiting the author's mode of treatment. The principal remedies were bleeding, and alteratives, particularly the iodides of arsenic and mercury, in minute doses, with the liquor potassæ and the iodide of potassium in sarsaparilla decoction. The frequent use of the tepid bath, with milk and farinaceous diet were found useful until near the termination of the disease, when more generous food and tonics, particularly the syrup of the iodide of iron, and the solution of the chloride of calcium in the decoction of sarsaparilla, were required. As topical remedies, none were found useful but the tepid bath, and a strong solution of nitrate of silver pencilled over the part.

A communication from Mr. Rumball was then read by the Secretary, containing some observations on Asthma, with the author's case.

SECTION F.—STATISTICS.

A letter was read from Mrs. Davies Gilbert, detailing the results of some experiments on a system of small allotments and spade husbandry.—She stated that she had reduced the number of paupers in the workhouse from 220, July 1840, to 130, July 1841; and that the people evinced such a desire to obtain work that they walked three miles up Beachy Head for it. She then entered into minute details of the system of husbandry pursued in the district, particularly dwelling on the benefit of forming tanks in chalk soils, and the importance of keeping milch cows under cover.

Sir C. Lemon read a paper 'On the Agricultural Products of Cornwall.'—He stated that he had commenced the paper some years ago, but meeting with unexpected difficulties he laid it aside for a time. But reflecting that many statistical records which have little value at the present day may, in a future age, possess importance, he resumed his labours; Cornwall being nearly surrounded by sea, he hoped to have been able, for a series of years, to compare the progress of population with the imports of grain and corn, but he found that the books at the custom-house in Falmouth had been destroyed, by order of the government, fourteen years ago, and nothing preserved but a few extracts, which were of no value in the present inquiry. From the various records and itineraries of Cornwall it appeared, that down to the date of Fraser's Agricultural Report in 1794, the agriculture of the county was neither deficient nor redundant, but nearly sustained the population. He read extracts from Leland's journey in the reign of Henry VIII.; from Carew, who states that in abundant seasons the county produced a surplus of corn for exportation; from Camden and Norden, who mention that corn is produced in competent abundance. Blome, who wrote in the reign of Charles II., states, that the country was more inclined to sterility than fertility, but that the manuring of the ground with sand enabled the industrious to raise good corn. Borlase, who wrote in 1756, asserts that agriculture had not increased in proportion to the population, and that the county was beginning to import corn. Fraser, who wrote in 1794, complains that agriculture was neglected, and that, if more attention were paid to it, the county would support more than its existing population. Mr. Morgan, in 1808, describes agriculture as having greatly improved since Fraser's time. The number of inhabitants in successive ages can scarcely be obtained. Lysons refers to a poll-tax in the reign of Edward III. (1377), and thence calculates the population of the county at 34,960 persons. The number in 1700 is stated by Marshall at 105,800. From Finlaison's returns Sir C. Lemon calculated, that in 1760 the number was 137,000. By the census of 1801 the population was 188,269. And from these data was framed a table of the population which probably was fed by the agriculture of the county, previous to 1794, when the importation of corn began.

Years.	Population.	Increase per cent. of agricultural produce.
1683	69,900	
1691 }	105,800	51
1733 }		
1756	135,000	28
1794	171,000	26½

The whole period 144 per cent.

Such appears to have been the progress of agriculture during the 200 years previous to Fraser's report. The present population is about 345,000, dependent on agriculture, fisheries, and corn im-

ported by the coasting trade for subsistence. From the returns collected it appears that there is an annual deficiency of 52,786 quarters of wheat. Against this is to be set an export of 11,690 cwt. of potatoes, valued at 5,845*l.*, and equivalent to 2,050 quarters of wheat at 57*s.* per quarter. No accurate information could be obtained respecting the amount of cattle which cross the borders to Devonshire, but from a comparison of various accounts, the number was estimated at 4,500, worth 300,600*l.*, and equivalent to 10,736 quarters of corn; and the supplies to shipping were considered equivalent to 5,000 quarters. In all, therefore, there are the equivalents of 17,786 quarters of exports, which, deducted from the imports, leaves a deficiency of 35,000 quarters, costing 99,750*l.* The exports from Cornwall are estimated as follows:

Copper ore, averages of 1838 and 1839	£862,527
Tin sold by ticketings	215,095
Do. by private contract	71,965
Lead	13,680
Silver	14,777
Iron	16,108
Sulphur, arsenic, &c., no return.	
Granite	8,667
China-clay, no return.	
Slate, no return.	
Pilchards and other fish	28,385

Making in round numbers about 1,300,000*l.* annually, and showing that about ½ of the annual exports covers the deficiency of agricultural produce. The consumption of cattle and sheep in the county, estimated from the hides supplied to the tan-yards, is,

Bullocks	15,950
Calves	11,550
Sheep	56,600

Computing the carcase of each bullock at 4 cwt. each, each calf at 1 cwt., and each sheep at ½ cwt., the gross amount will be 135,500 cwt., equal to about 45 lb. for each person of a population of 336,000 souls. This is exclusive of pig's meat, the consumption of which cannot be ascertained, but is certainly great. It is estimated that there are in Cornwall

Of cultivated land	550,000 acres.
Of improvable land	190,000
Of unprofitable land	109,000

To ascertain the qualities of the soil, Sir C. Lemon had specimens analysed of the natural soil taken from the three principal geological formations, viz. the slate, the serpentine, and the granite. This analysis gave very unexpected results. There was an extraordinary similarity between the ingredients and the proportion in all these specimens, and what was still more surprising, a total absence of some of the characteristics of the rocks beneath. The feldspar in granite contains about 17 per cent. of potash, but there is no potash in the soil above. The serpentine contains from 30 to 40 per cent. of magnesia, but there is no magnesia in the soil of Goonhely Downs. Yet these are indestructible substances, and if the soil had been formed by the decomposition of the rocks beneath, a considerable quantity of each must have been present. As these soils are deposited on high grounds, in the case of Goonhely Downs, extending over a very large and elevated plateau, Sir Charles concluded by proposing, as a geological problem, "Whence did they come? How formed? or how transported?"

A brief conversation followed respecting the importance and difficulty of obtaining the statistics of the consumption of food, in which Lord Ebrington, Col. Sykes, Dr. Bowring, and Mr. Heywood took part.

The Report of the Manchester Statistical Society, 'On the state of the Working Classes in the borough of Kingston-upon-Hull,' being a continuation of the Report on the state of Education in that borough, presented at a previous meeting (*Athen.* No. 679). The inquiry, had been intrusted to an intelligent agent who visited every house, and made an accurate return of the information he received. Such an inquiry was attended with great difficulties, which could only be overcome by patience and perseverance. At one moment Chartists or Socialists believed that it was levelled at them; the right to inquire into the private concerns of individuals was denied by others, while numbers identified the investigation with the poor-laws, or some other government measure. The Irish were at first much excited, a report being spread that the inquiry had reference to a project for their removal, but when the matter was explained they not only showed the agent every civility, but rendered him all the assistance in their power. Hull affords less employment to females and children, and a more variable supply of work to men than the manufacturing districts. It also contains a far less proportion of immigrants from Wales and Scotland. A superior state of education and certain advantages in physical condition, are also distinguishing traits of this district. Out of 8,757 dwellings only 15 were cellars, containing 44 inhabitants, that is 1¼ per cent. of the whole population, or 1½ per cent of the working classes; while in Liverpool 20 per cent., and in Manchester and Salford about 10 per cent. live in cellars. The separation of families is also more distinct, and the system of taking lodgers less generally practised; the average of individuals to each occupation being 4¼ in Hull, and 5½ in Pendleton, near Manchester, where a similar inquiry was instituted. The length of residence in the township has been ascertained, in the case of ⅞ of the families recorded; and from this return it appears that in ¼ of the ascertained cases, the heads of families are natives of Hull, and more than ½, though not natives, have resided in the borough not less than 10 years. The centesimal proportions of the population, according to their country, are,—

English	95.08 per cent.
Irish	2.24
Scotch	1.36
Welsh	0.48
Foreigners	0.84

Out of 9,832 males only 709 were unemployed; but out of 11,400 females, only 2,606 carried on an ostensible trade, apart from household occupations. In the remaining 8,794 females are not included domestic servants, or those having a definite calling within doors. It is worthy of remark, that this number of unemployed females coincides almost exactly with that of the heads of families; and hence it may fairly be concluded that, in ordinary times there are but few cases in which the labour of adult males is not sufficient to maintain the family in tolerable comfort. The rental of cottage-houses in Hull appears to be very moderate—the average being about 2*s.* 4*d.* per week for houses, 1*s.* 5*d.* for chambers, and 1*s.* 2*d.* for cellars—an average applicable to rather more than half the residences of the working classes. The state of drainage and the supply of water are points very difficult to be ascertained, but so far as information has been attained, Hull may be considered favourably circumstanced in both respects.

Drainage.		Water.	
With adequate drainage	4,116	With an ample supply	4,957
Inadequate	671	Inadequate	209
No drainage	299	No supply	107
Not ascertained	2,771	Not ascertained	3,484
Total	8,757	Total	8,757

The dwellings in Hull have a decided advantage over those in the manufacturing districts; the rents are lower, the streets cleaner, the houses better ventilated and less frequently built in courts.

Number and Condition of Dwellings.

Dwellings.	Respectable.	Comfortable.	Middling.	Uncomfortable.	Not ascertained.	Total.
Houses	2,809	1,439	448	1,181	362	8,239
Chambers	91	547	673	869	323	2,503
Cellars	0	0	10	5	0	15
Total	2,900	1,986	1,131	2,055	685	8,757

From this table it appears that two-fifths of the houses of the working classes are comfortable, one-fifth middling, and two-fifths uncomfortable. The following is the return respecting cleanliness:—

Dwellings.	Respectable.	Clean.	Middling.	Dirty.	Not ascertained.	Total.
Houses	2,809	1,639	915	A 439	446	6,239
Chambers	91	898	735	B 534	245	2,503
Cellars	0	7	6	2	0	15
Total	2,900	2,544	1,656	966	691	8,757

33 of those marked A, and 41 of B, are set down as filthy and offensive. From hence it appears that in the ascertained cases, one-half were clean, about one-third middling, and rather more than one-sixth dirty. Information respecting the number of rooms and inmates in each dwelling-house was obtained from about four-fifths of the working class. Out of the ascertained cases, about five-sixths have an average of three persons to one room, while the remaining one-sixth have only one room for every seven individuals. As the minuteness of the inquiry increased, so did the difficulty of obtaining information, the number of sleeping-rooms, as compared with the number of inmates in each dwelling having been ascertained for only about three-fourths of the working population. Of the ascertained cases, two-thirds do not exceed the average of three to a sleeping-room, while the remaining one-third average above six; there are 57 cases in which there were from ten to thirteen in each bedroom. The number of beds in each dwelling compared with the number of inmates, could only be ascertained in about two-thirds of the cases. In the ascertained cases, three-fourths do not average more than three to a bed; while the remaining one-fourth, viz. 1,159 cases, average six to a bed, 103 of them having from seven to eleven persons sleeping in one bed. Comment on such a state of things is superfluous; its existence is not willingly acknowledged by the people themselves, and the information can seldom be elicited by direct inquiries. The majority of the benefit societies in Hull are not enrolled under the act, and consequently they afford little security to the subscribers, even when the principles upon which they are based do not happen to be unsound. The heads of families residing in 1,615 houses and chambers are enrolled in benefit societies, 3,496 do not belong to such bodies, and 3,646 have not been ascertained. The last head of inquiry related to the extent in which books were possessed by the people. The question could not well be pressed in the case of the more respectable classes, a circumstance which will account for the large number of unascertained cases:—

Dwellings.	Houses.	Chambers.	Cellars.	Total.
Possessing books	2,253	1,294	8	3,555
.. a Bible only	34	39	0	73
.. a Testament	42	33	2	77
.. no books	484	734	5	1,223
Not ascertained	3,426	403	0	3,829A
Totals	6,239	2,503	15	8,757

Of the 3,829 marked A, 2,900 belong to the respectable class, and may therefore be fairly presumed to possess books. The greater part of the remaining 929 had one or more religious tracts, which they were in the habit of receiving from visitors who called periodically, to exchange them for others gratuitously. In conclusion, remarks were made on the difficulties attending these inquiries, particularly where the results may be referred to a capricious and variable standard, as in the instances of comfort, cleanliness, &c. The following is the account given by the Manchester agent of the principle on which he acted:—"The word *comfortable* must always be a vague and varying epithet, nor is it possible to attach any precise definition to it. In filling up this column, I was guided by observing the condition of the dwelling-houses apart from any consideration of order, cleanliness, and furniture. If I considered it capable of being made comfortable by the tenant, I set it down accordingly; and if it were damp, the flooring bad, and the walls ill-conditioned, I set it down uncomfortable."

There was no discussion on this paper, but before passing to the next the chairman mentioned the great obligations under which the Section had been placed on many former occasions by the Manchester Statistical Society. He said that the Committee which had superintended the Hull inquiry (Messrs. Greg, Langton, & Romilly) had conferred a benefit on society, by directing public attention to the condition of the working classes.

Mr. Fripp read a paper on the Statistics of Education in the city of Bristol, which was intended to complete and perfect the Report he had made on the subject at the meeting of the Association in 1836. The present population of the city of Bristol is about 120,000, and this number is assumed as the basis for the proportions between the instructed and the uninstructed. The schools which formed the subject of inquiry are divided into six classes.

Infant schools	14	with 1,705 scholars,	11.60 per cent.
Dame ,,	217	3,015	20.52
Common day and evening	219	7,900	53.77
Free and endowed	24	1,334	9.08
Superior	38	740	5.03
Total day schools	512	14,694	
Sunday schools	86	7,171	
Schools	598	21,865	

The total number attending Sunday schools is 11,684, but 4,513 also attend day-schools, and are therefore not reckoned. It appears that of the total number of children receiving instruction,—

10,181, or about 8½ per cent. of the population, attend day and evening schools.
4,513, or about 3¾ per cent. attend both day and Sunday schools.
7,171, or about 6 per cent. attend Sunday schools only.

Of the total number of children in day and evening schools—
7,825, or 53½ per cent. are boys.
6,869, or 46¾ per cent. are girls.

In the Sunday schools there are—
5,780, or 49½ per cent. boys.
5,904, or 50¼ per cent. girls.

The following is a comparative statement of the ages of the children attending day and evening schools:—

Under 5 years of age..	3,274, or 22¼ per cent.
Between 5 and 15	10,730, or 73 per cent.
Above 15.....	502, or 3½ per cent.
Not ascertained.....	188, or 1¼ per cent.

The following is the estimated amount of payments in the schools entirely supported by the pupils:—

	Scholars.		Per annum.
217 dame, containing	3,015,	paying	£ 2,390 17 9
177 common day	3,479		10,298 11 8
14 evening	253		387 10 2
Total ..408	6,747		13,076 19 7
38 superior	740		18,500 0 0
Total ..446	7,487		31,576 19 7
In schools assisted by subscription—			
14 infant, containing	1,705	paying	632 3 6
22 common and day	4,168		1,831 6 7
24 free and endowed	1,334		
Total ..512	14,694		£ 34,090 9 8

Reading is taught in 486; Writing, in 292; Arithmetic, in 250; Needlework, in 344; Knitting, in 36, Grammar, in 196; Geography, in 186; History, in 153; Drawing, in 45; Classics, in 23; Mathematics, in 22; Music, in 1; Domestic duties, in 4; Moral duties, in 362; Religious duties, in 371; French, in 46; Mensuration, in 22; Navigation, in 2. Refused information, 23.

Mr. Fripp regretted that it was impossible to give an account of the quality of education in a statistical form, and stated that without such an element of information, every report on education must be imperfect.

Section G.—MECHANICAL SCIENCE.

'On Captain Couch's Chock Channels.'—Mr. Snow Harris explained and illustrated, by a model and drawings, the safety chock channel, for allowing the masts and rigging of vessels to be easily disengaged when the masts are carried away. Many cases have occurred in which, with the rigging and ordinary channels, the greatest danger has been incurred, in consequence of not being able to get clear of wreck. The ordinary channels may be blown up by the sea; whereas, if made solid, on Capt. Couch's plan, all danger from this source will be avoided, and the sailors would be at once able to clear the vessel of any wreck.

'On Arnott's Stove, and the Construction of Descending Flues, and their Application to the purposes of Ventilation,' by J. N. Hearder.

The general advantages of Arnott's stoves in economizing fuel, avoiding smoke, and regulating the temperature, are well known; but these stoves are attended with some disadvantages, of which the danger of explosion, and imperfect ventilation, are the most serious. The liability to explosion, Mr. Hearder considers to arise from the construction of the stove, in having the door air-tight; the only apperture for air being the valve aperture of the ash-pit. The air so admitted is immediately decomposed, and nearly the whole of its oxygen is abstracted, so that by the time it has passed up through the fuel, and reached the upper chamber of the stove, it has not oxygen enough left to support combustion. The heat evolved by the lower stratum of fuel, acting upon the upper stratum of fresh or unignited fuel, liberates from it the inflammable gas which it contains, and which also accumulates in the top of the stove. A mixture is then formed analogous to the fire damp of coal mines, ready for explosion whenever the requisite oxygen or degree of temperature shall be present. Under these circumstances, should the door be opened, a burst of flame outwards may be the result; or should a puff of wind down the chimney carry the mixture down through the ignited fuel, an explosion may ensue. Other causes, such as the sudden shutting or opening of the door of an apartment, may occasion the downward draft and consequent explosion. Now carburetted hydrogen will not explode when the proportion of the air to the hydrogen exceeds a certain limit, so that if air be supplied to the top of the stove, so as greatly to preponderate over the hydrogen, the latter will burn off in a flame at the moment of its formation, or be carried up the flue. Mr. Hearder, therefore, proposes as a remedy, perforations through the lower edge of the door, so that air may be admitted on a level with the top edge of the fire brick, through which a constant in-draught of atmospheric air will be insured, sufficient to obviate the evil. The heat evolved by the perfect combustion of this inflammable gas, under these circumstances, will, he says, more than compensate for the admission of cold air into the upper part of the stove. The perforations just mentioned will also obviate, in a great measure, the want of ventilation. The author suggests a small rarefying apparatus, to be inserted in the vertical shaft connected with a descending flue.

'Report of the Committee on Railway Constants,' by Edward Woods.

In a preceding Report of the Committee (published in the 8th volume of the Transactions of the British Association), five various modes of ascertaining the resistance to the tractive power on railways were described, and their relative merits discussed, and a variety of experiments on one of these methods, viz. by observing the motion of a load down an incline, sufficiently steep to give accelerated motion, having been made, it appeared, that the resistance increased in a degree previously unsuspected in proportion as the speed of the train increased,—but in what ratio, was not then determined, owing to certain discrepancies due, principally, to the varying effect of the wind at the time of the experiments. The Committee have continued to conduct their experiments in a similar manner, repeating them with various sizes of trains, at various velocities, on the Sutton incline, of 1 in 89 on the Liverpool and Manchester Railway, and on the inclines of 1 in 177, 1 in 265, and 1 in 330 on the Grand Junction Railway.* The data ascertained and given in the Report are,—1, The co-efficient of gravity on the inclination of the plane. 2, The initial velocity of train at some determinate point on that plane. 3, The terminal velocity at some other determinate point on the same plane. 4, The time elapsed in traversing the space intervening between these two points. 5, The space intervening. 6, The force of gravitation. 7, The weight or mass of the train, exclusive of the wheels and axles. 8, The weight or mass of the train subject to the rolling motion, viz. the wheels and axles. 9, The radius of the wheels. 10, The distance from the centre of the wheel, to the centre of oscillation. If a body move down an inclined plane without resistance, its velocity at any given depth below the level of the point where its motion first commences, will be equal to the velocity it would have acquired by a free vertical descent through the same height. This standard velocity being compared with the observed velocity of a body moving down an incline, and meeting with resistance, the amount of that resistance can be assigned. This mode has been objected to, from the apparent inconsistencies in the results; but these may be readily explained; and the Report shows a remarkable correspondence in the motions of the same train, when permitted to descend the same plane from the same point, provided the atmosphere be perfectly calm. The usual formula is applicable to three cases of accelerated, uniform, and retarded motion; the co-efficient of gravity is greater than, equal to, and less than the co-efficient of resistance accordingly; and the requisite correction will be negative, zero, and positive, so that the co-efficient of resistance may be found in all cases. The method of determining this correction was set forth in the former Report. When the motion is uniform, the mean resistance for any particular velocity may be assigned; but when the motion is accelerated or retarded between the two points of observation, although the mean resistance may be known, it cannot be stated with accuracy, whether that mean resistance is due to the mean velocity, or to some other velocity intermediate between the limits of the initial and terminal velocities, because experience has not yet assigned the law of the corresponding increments of resistance and speed. The results which the tables of this Report present, are considered under the following heads: the determination of the friction; the additional resistance produced by increase of speed in trains of different sizes; the effect of modifying the form of the front or end of carriages, and of other changes in the external surface of the train. Three first-class carriages were allowed to descend the Sutton incline from rest four times in succession, a length of 2420 yards. It appears that the resistance diminishes until the train attains the speed of 7.58 miles per hour, after which it increases; at 4.32 miles per hour, the resistance was 6.07lb. per ton; at 7.58 miles per hour, 5.6lb. per ton. This remarkable and hitherto unobserved result is owing, probably, to the more perfect lubrication of the axles at the higher speed; a certain thickness or film of grease is formed between the brass step and the upper surface of the journal, and keeps the two surfaces more effectually apart; at the lower velocities, the pressure of the step upon the journal has a longer time to act in effecting the displacement of the fresh grease which has been supplied from the box, and the result is, a greater amount of friction. Eight second-class carriages were allowed to descend the Sutton incline; the friction was a minimum at 5.84 miles per hour. The following results may be deduced from the above-mentioned series of experiments. 1, The friction was least when the train was moving at the rate of about 6 miles per hour. 2, The total resistance was also least at the rate of about 6 miles per hour, notwithstanding the effect of the atmosphere at that speed. 3, The mean resistance of first-class carriages was never less than 5.6lb. per ton; and of the second class never less than 7.75lb. per ton; 6 and 8lb. per ton will represent very nearly the mean of the resistances; and these values are used in the subsequent part of the Report. The motion of these trains being observed at lower parts of the incline, where the velocities were greater than the preceding, the resistance to the train of three carriages was 8, 12, and 16lb. per ton, at velocities of 22, 26, and 29, miles per hour respectively, and the resistance to the train of eight carriages was 11, 12, and 14½lb. per ton, at the velocities of 20, 25, and 29 miles per hour. Trains of 4 and of 6 carriages were impelled to the summit of the incline, and, the engine being detached, commenced their descent at the rate of 33 and 26 miles per hour. They descended through the first half of the incline with a mean velocity of 34 and 29 miles per hour, and through the latter half, with a mean velocity of 37 and 33 miles per hour. Other series of experiments were made on the Grand Junction inclines; and the result of the whole shows the existence of an opposing power, created as it were by the speed itself, far exceeding that hitherto suspected.

A train of eight carriages weighing 40½ tons was started down the Madely incline 1 in 177, at speeds varying from 23 to 26 miles per hour; the mean speed attained was 25½ miles per hour. The motion of the train became uniform, so that the coefficients of gravity and resistance were equal. The mean resistance of the train was 12¼lb. per ton. A train of four carriages was started down the incline at 40 miles per hour half way down the plane, the velocity was reduced to 30 miles per hour, and at the foot, it was only 25 miles per hour. Four other carriages were started at a velocity of 32.7 miles per hour, they were retarded to 22.7 miles per hour, and proceeded with this uniform velocity to the foot of the incline. The results obtained in these experiments with the trains of eight carriages are of great practical importance, this being the nearest approach to the average passenger trains. 30 miles per hour is a fair average speed, and the resistance at the speed is about 15lb. per ton, or almost double the value of the friction only. The friction may be diminished by proper attention to the fittings and the perfect lubrication of the axles, but its reduction is of secondary importance in the economic working of passenger trains, which, from their high velocity, must necessarily bring into play large and independent sources of resistance. The resistance to trains at different speeds being ascertained, the Committee directed their attention to the effect of external configuration on the resistance. A pointed body, as a prow and stern, was fixed successively to the front and end of a train, but the differences observed were extremely slight, and such only as would have occurred with the same experiment repeated twice over; the pointed figure, whether before or behind, exercised no appreciable influence on the rate of the train's motion,

* As Dr. Lardner's paper on "the Resistance of Air to Railway Trains," (read at Newcastle, and reported fully, with diagrams, *Athen.* No. 619,) was founded on these experiments, the reader had better refer to it.

or on the resistance of which that motion is the index. Experiments were also instituted, to ascertain whether the carriages being sent with their square ends forward, instead of being preceded by an engine and tender, would affect the results, but here also there were no greater differences than might be expected in an experiment repeated twice over; and it may be fairly concluded, that the form of the front has no observable effect, and that whether the engine and tender be in front, or two carriages of equal weight, the resistance will be the same. The intermediate spaces between the carriages were closed in, by stretching strong canvas from carriage to carriage, thus converting the whole train into one unbroken mass. The results were in favour of the train without canvas, but the differences are extremely slight; it is certain that no additional resistance is occasioned by leaving open spaces between the carriages, confining the intervals to the dimensions allowed in practice.

The Committee having ascertained that the excess of resistance, after deducting friction, required for its estimation something besides the elements of the dimensions and form of frontage, and of continuity of surface, it becomes important to inquire, what is the element exerting so powerful an influence? Their former Report contains the results of experiments with waggons on the Madely incline loaded to six tons each, and furnished with boarded fronts and sides moveable at pleasure; the differences in the results attained, were then referred to the increased frontage alone. But the experiments detailed in the present Report having been made, it became probable that the increased resistance was in a great measure dependent on the general volume of air displaced; and the Committee recommend experiments to be directed, to ascertain the effect on the resistance of diminishing and increasing the bulk of trains, the weight remaining the same.

Experiments were also made with the view of determining the amount of moving power expended in working a line, and for this purpose, the character of the line, in respect of its inclines, the weight and bulk of the train, and the speed at which the load is required to be conveyed, must be considered. The first of these alone is constant, depending on the nature of the acclivities and declivities. As an abstract question of dynamics, the power expended (the resistances being supposed constant, whatever the speed) is the same for a train travelling between two points on the same level, whether the road be level or undulating, a due allowance being made for the difference of distance traversed. On the level line of railway, the speed of travelling would be uniform, but on the undulating line it would vary. And the real question is, will the increased velocity on the declivities compensate for time lost on the acclivities? Will the average rate of speed over the whole line be different? In order to obtain some definite result on the point, it was determined to send a train from Liverpool to Birmingham and back, a distance of 190 miles. Great care was taken in conducting this experiment, and the results are tabulated in great detail; and the following remarkable inference may be drawn, that a train of twelve carriages drawn by the same engine can be conveyed over a railway whose gradients range within the specified limits, in the same time as it could over a perfectly level railway of the same length. In ordinary practice, an engine of the dimensions tried (the Hecla) would receive assistance up the Sutton, Whiston, and Warrington inclines (1 in 89, 96 and 80), but this was not the case in the experimental trip, and the train encountered acclivities and declivities not contemplated in the application of this theory. It may therefore be inferred that the opinion entertained was correct, or that trains whose weights bear an ascertainable relation to the nature of the inclines they have to traverse, may be made to traverse those inclines at an average speed equal to what the power of the engine can effect on a level, and that an ordinary train would travel over the Grand Junction Railway (the steeper inclines of 1 in 96 being excepted) in as short a time as if the line had been absolutely level.

Mr. Brunel remarked on the inapplicability of results obtained from trains running down inclines to the ordinary working of trains on railways. Many of the results given in the Report differ exceedingly from the results of his experience in the working of the Great Western Railway. The cause of this discrepancy arose from the manner in which the resistances were obtained. In a train of carriages running down an incline, each carriage is slightly pressed upon by the next behind, so that the whole train is in the condition of a train that is pushed; and it is well known that the resistance of a train pushed from behind is much greater than of the same train pulled from before, as the carriages are thrown out of square.

'On the Granite Quarries of Dartmoor, and their Railways and Machinery,' by W. Johnson.

The surface granite of Dartmoor, existing in detached blocks, has been long employed in the neighbourhood for ordinary building purposes, but the quarried granite was first brought into the market by the Haytor Granite Company about the year 1820. The construction of a stone tramway enabled the granite to be shipped at Teignmouth; it now competes with the best Aberdeenshire, since the lightness of its tint, the fineness of its texture, and the very large blocks in which it can be obtained, render it for some purposes unrivalled, and it has been extensively employed in many public buildings, both in the metropolis and other places. The completion in 1825 of the Plymouth and Dartmoor Railway, of the length of 25 miles and uniform rise of 1 in 94, affords ready transport for the granite of the western face of the moor from Fogginton and other parts adjacent, and the facilities with which these quarries are worked are very great. Strong timber stages with travelling frames, and upon the frames powerful traversing crabs, avoiding thereby the labour and delay of lifting by the ordinary means of derricks and cranes, are now in the course of construction. The travelling frames, with the crabs upon them, can be transferred from one line of scaffold to another, so that power may be accumulated to any extent upon one stage, so as to operate on blocks of extraordinary size. The magnitude of the blocks in which the granite can be procured from this quarry, renders it peculiarly fitted for the largest works of the engineer. The beds already accessible lie at great depths below the surface, and yield stone of the greatest compactness, strength, and uniformity of colour, and the horizontal disposition of the rock allows of the removal of stone of fair forms and in blocks of the largest size.

Mr. Rendel bore testimony to the excellence of the quality of the Dartmoor granite, and to its peculiar fitness for any kind of work. The material was extremely good, and of sufficient fineness to admit of the most delicate moulds being made for it. It cleaves freely; there is little waste, and pieces of stone of all sizes, from the smallest to the largest, can be readily obtained. He had, some time ago, taken the dimensions of a block, and found it to be 67 feet in length, 5 feet by 8 feet at one end, and 3 feet by 5 feet at the other end. If a great outlay were justified, this granite would be the cheapest stone that could be used.—The President stated, that he had attempted, some years ago, to introduce this granite into the market by means of the canal, near Tavistock, and now that such facilities existed for its transport, he would direct public attention to the beautiful slabs, columns, vases, and forms into which the Aberdeen granite was worked, and express his hopes that before the British Association next met at Plymouth, there would be a large manufactory of these articles in Dartmoor granite. The beautiful porphyry of Cornwall might also be employed in a similar manner. He could mention a remarkable instance of the durability of the Dartmoor granite. A slab which had been used as a foot-bridge from time immemorial had recently been removed, and on the face, which had been turned downwards, was a Roman inscription, showing it to be at least 2000 years old.—Mr. Eaton Hodgkinson, in reference to some questions which had been asked, respecting the strength of stone according to the position in which it was placed, stated that in all bodies of uniform texture the strength would be the same in whatever position they are placed, but in bodies that are laminated the case is very different. He observed a very pernicious practice to have prevailed in the construction of many of our buildings, namely, the placing the stone without any regard to the direction of its lamination. He had extended his experiments to a great variety of stone, and he found that cubes of granite when broken with the greatest care, break up at once into wedges. Some valuable experiments on the strength of granite were published in the Transactions of the Institution of Civil Engineers, but the mode in which the experiments had been conducted was not stated, and a distinction is drawn between the crushing and the breaking force; but he thought that if the experiments had been made by pressing the stone between two perfectly smooth plates a somewhat different result would have been found; the granite would have broken up at once without crushing, as was uniformly the case in his experiments. He thought it important to interpose a thin substance, as a sheet of paper, between the plate and the stone; the pressure by this means becomes more perfectly distributed. A remarkable connexion existed between the ratio of the forces of extension and compression, and the angles at which the wedges or masses would slide off when broken by pressure. If these forces were equal, the wedges would slide at an angle of 45°.—Prof. Moseley remarked that the experiments of Mr. E. Hodgkinson were peculiarly valuable, because he had not confined himself to cubes, but extended his experiments to other forms. A singular prejudice had existed in favour of cubes. The commissioners appointed to report on the stone for building the House of Commons, experimented simply on cubes, whereas rectangles would have been much better.

Expedition up the Euphrates.—A vessel belonging to a leading firm at Liverpool was sent to sea under sealed instructions, about 18 months ago, having on board two iron steam-boats, and other cargo of a similar unusual description. The destination of the vessel, as now appears, was the Persian Gulph, the steamers having been constructed by order of the East India Company to act as a flotilla for ascertaining the navigability of the river Euphrates. The expedition has been highly successful, having traversed the course of the stream 1,100 miles from its mouth. The following are extracts from a private letter dated "Belis, June 6," written by Mr. Floyd, the surgeon of the flotilla, and brought by the last overland conveyance:—"I am now near Aleppo with the flotilla, having completed the ascent of the river Euphrates, without doubt one of the noblest rivers in Asia; here, at a distance of 1,000 miles from its *embouchure* in the Persian Gulph, it is 400 yards broad, and very deep. The Euphrates differs little from the Tigris up to Hilla, a Turkish Arab town, built near the site of ancient Babylon, except that its banks are much better cultivated, and in some the date tree (the *Palma dactiliferus*) adds to the picturesque meanderings of the river; while in others, a mosque, with its lackered dome rising from a grove of willows, is a pleasing variety from the monotony of the surrounding district. The river is enclosed within a valley of high rocks, which extends from its source, to below Hit. They are composed of gypsum, sandstone, and conglomerates with mica and feldspar. This climate is delightful, and produces all the varieties of European fruit, besides many of the tropical ones lower down the river. The only obstacle to the navigation of this river consists in the remains of the water-wheels used for irrigation. In the short space of 130 miles we found nearly 300 of these wheels, about one-third of which are in operation at the present day. They consist of large parapet walls built into the stream, directing the current of the river to the wheels, which are the most clumsy piece of mechanism, made of branches of trees, and having slung round them 150 clay vessels to raise the water in. The wheels are 40 feet in diameter, placed at the end of an aqueduct raised upon well-built Gothic arches. It is surprising the quantity of water which they raise to the surface. They cause a current of six or seven knots, with a fall of two or three feet where they are, so that this part of the river is difficult, and somewhat dangerous. The Tigris to Mosul, the site of the ancient Nineveh, and the Euphrates to Baulus—I might say to the heart of the Taurus (for we may go higher)—is now proved navigable."—*Liverpool Times.*

To Correspondents.—W. G. P., Dursley—A.—E. M.—Percy Vere—The Author of Appendices, &c.—C. T. C.—A. T. J.—A. M. A.—Maria—A Man of Taste, received.

Errata.—Page 626, col. 3, Mr. Williams observed that organic fossils were more abundant in *South* Devon and Cornish rocks than in the older deposits of Exmoor—not, as stated, in *North* Devon. Page 627, column 1, line 61, for *occupation* read *eruption*.

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